CHAPTER 4

RESULTS

To begin with , the largest challenge in this work was to confirm and report a total of 382 insect species from 4 different habitats covering Vadodara city and its surrounding area.

Within the unruffled Agricultural fields, the serene Laxmivilas palace compound., the beautiful gardens and the turbulent city areas clicking insect photographs was an experience.

Photograph of one representative insect from almost each family has been selected for the thesis . (Figures 17-109). Whereas all 283 identified and confirmed (except a few) are given in compact disc.

Species are not pennies. A machine can be designed to count 30 million pennies, but counting 30 million species is different (Ragaei and Allam,1997).

During the period of 2005-2007 a total of 17 insect orders were collected, 2 species of 2 genera belonging to 1 family of Thysanura was collected. Order Diplura, Collembola, Ephemeroptera, Phasmida and Embioptera were represented by 1 family, with 1 genus and 1 species each. Odonata is represented by 4 families with 19 genera and 22 species.

17 species from 15 genera belonging to 4 families of Orthoptera were identified. Dermaptera was represented by 2 families with 2 genera and 2 species. 2 families of cockroach with 3 genera and 3 species as well as 1 family of mantid with 5 genera and 5 species were noticed.22 families with 52 genera and 59 species of Hemiptera were collected and identified. Thrips belonging to 1 family with 4 genera and 4 species were identified. 3 families of Neuroptera were represented by 5 genera and 5 species. 25 families of beetles represented 77 genera and 93 species.17 families with 30 genera and 32 species of Diptera were collected and identified. Butterflies and moths of 16 families with 67 genera and 88 species were observed and identified.15 families of Hymenoptera with 29 genera and 45 species were recorded. (Table 21)

This does not include Proturans, endoparasitic insects orders like Psocoptera, Mallophaga, Siphunculata, Strepsiptera, Siphonoptera, unfamiliar orders like Trichoptera and orders which I could not sight like Plecoptea. Grylloblatodea is seen at altitudes of 1500-6500 ft. Zorapterans are not found in India.

A thesis has been submitted to The M.S.University of Baroda by Manoj Kumar Pardeshi on Termites. Another colleague from my lab has taken ecology and conservation of Formicidae therefore Ants are also not discussed.

Thus total 17 insect orders with 118 families having 315 genera and 382 species were identified in the Vadodara district in tenure of three years

From the agricultural fields 323 species from 286 genera of 106 families was recorded. From the community gardens 310 species of 271 genera from 106 families were recorded whereas from residential sites the number was little less. It was 284 species 252 genera from 104 families. The fragmented habitats can sustain a good variety of insect species diversity. 327 species from 290 genera of 109 families. (Annexure 2)

It is because of large number of gardens within Vadodara and equally large number of Agricultural fields in Vadodara district a rich bio-diversity of insects is maintained.

The details of the results have been described in tabular form (Table 4)

Details of results in tabular form

Table 4 Thysanura

Sr. No.		Season	Habitat	Food-feeding
I.1	**Lepismatidae**			
I.1.1	*Lepisma saccharina* Linnaeus,1758	Throughout the year	From storerooms, wardrobes, and maximum collected from unused books of British fauna in the Library.	Feeds on papers of books
I.1.2	*Thermobia domestica* Packard, 1873		From kitchens	Feeds on carbohydrate food on kitchen platform
	Remark	*Nocturnal,nearly always associated with human habitation*		

Table 5 Collembola

Sr. No.		Season	Habitat	Food-feeding
II.1	**Isotomidae**			
II.1.1	Unidentified species	Throughout the year	Beneath the leaf litter and decaying vegetation of all fields and gardens	Feeding on decaying vegetation of *Mangifera indica, Moringa oleifera*
	Remark	*Decomposers in the soil*		

Table 6 Diplura

Sr. No.		Season	Habitat	Food-feeding
III.1	**Campodeidae**			
III.1.1	*Campodea staphylinus* Uzel, 1898	Throughout the year	Beneath the decaying wood near Vishwamitri stream in university campus and below small stones in fields.	Feeding on decaying vegetation of *Tamarix gallica, Nicotiana plumbeginifolia*
	Remark	*Decomposers in the soil*		

Table 7 Ephemeroptera

Sr. No.		Season	Habitat	Food-feeding
IV.1	**Ephemeridae**			
IV.1.1	*Ephemera vulgata* Linn,1758	In the month of May	Larval forms aquatic attached to plant material of *Trapa, Utricularia and Nymphea.* Adults hovering near ponds in botanical garden of University campus	Niads feed on parts of *Trapa, Utricularia* and *Nymphea* as well as algal material. Adults non feeding
	Remark	*Fish in the ponds feeds on the may flies niads. A* clean pond indicates a good population of may fly niads. (Bio –indicators)		

Table 8 Odonata

Sr. No.		Season	Habitat	Food-feeding
V.1	**Coenagriidae**			
V.1.1	*Ischnura aurora* Brauer,1865	Throughout the year except from last week of April to 2nd week of June	Nymphs hiding around underwater Structures. Adults flying around the vegetation near the ponds and rivers of Vishwamitri During June to august *I.senegalensis, C.coromendalianum, P.decanensis, A.violacea* also on grasslawns, roads and lanes of residential areas. *A.pygmae* flies very close to the ground. *I.rapax* usually perches on a bare twig facing the water *G.dravida* occasionally comes to light at night.	Nymphs of *I.aurora, I.Senegalensis, P.microcephalum,A.pygmae and C.coromendalianum* feed on larval forms of mosquitoes ,small fishes Adults of *I.aurora, I.Senegalensis, P.microcephalum, A.pygmae and C.coromendalianum* feeds on mosquitoes, winged ants Nymphs of *P.deccanensis, A.violacea, I.rapax* feed on larval forms of mosquitoes ,small fishes Adults of *P.deccanensis,A.violacea, , I.rapax* feed on mosquitoes, winged ants Nymphs of *A.jaspidea, G.dravida,*
V.1.2	*I.senegalensis* Rambur,1842	2nd week of June to last week of Oct		
V.1.3	*Pseudagrion microcephalum* Rambur,1842			
V.1.4	*Agriocnemis pygmaea* Rambur,1842	1st week of Nov to 1st week of March		
V.1.5	*Ceriagrion coromandelianum* Fab,1798	Throughout the year except from last week of April to 2nd week of June		
V.1.6	*Platysticea deccanensis*	2nd week of June to last week of Oct		
V.1.7	*Argia violacea* Hagen,1861			
		Throughout the year except from last week of April to 2nd week of June.		
V.2	**Gomphidae**			
V.2.1	*Ictinogomphus rapax* Rambur,1842			
V.3	**Aeshnidae**			
V.3.1	*Anaciaeschna jaspidea* Burmeister,1839	2nd week of June to 1st week of Nov.		

Sr. No.		Season	Habitat	Food-feeding
V.3.2	*Gynacantha dravida* Lieftinck,			*B.contaminata, C.servelia, A.brevipennis, O.glaucum, O.sabina* feed on larval forms of mosquitoes ,small fishes Adults of *A.jaspidea, G.dravida, B.contaminata, C.servelia, A.brevipennis, O.glaucum, O.Sabina* feeds on mosquitoes, winged ants Nymphs of *O.pruinosum,D.trivialis, B.geminata, C.lineata, T.festiva* , *P. flavescens* feed on larval forms of mosquitoes ,small fishes Adults of *O.pruinosum,D.trivialis, B.geminata,C.lineata, T.festiva* , *P. flavescens* feeds on mosquitoes, winged ants
V.4	**Libellulidae**			
V.4.1	*Brachythemis contaminata* Fab,1793	Throughout the year except from 1st week of May to 1st week of June	Near ponds in botanical garden as well as Lalbaug puddles and water storage tanks of residential areas and Laxmivilas Palace compound, river banks in Sayajibaug *C.servelia* also found darting in *Oryza sativa* fields of Padra.	
V 4.2	*Crocothemis servelia* Drury,1770			
V.4.3	*Aethriamanta brevipennis* Rambur, 1842	2nd week of June to last week of Oct		
V 4.4	*Orthetrum glaucaum* Brauer,	Throughout the year except from last week of April to 2nd week of June	In all the study sites. *D.trivialis* usually perches on the ground and rarely flies above 1m. *B.geminata* usually seen perched on compound stone walls where it easily merges with site. *T.tillarga* frequently comes to light at night in residential areas *C.lineata* is a high flier. *T.festiva* perches on boulders.	
V 4.5	*O. sabina* Drury,1770			
V4.6	*O.pruinosum* Burmeister,1839			
V4.7	*Diplocodes trivialis* Rambur,1842			
V4.8	*Bradinopyga geminata* Rambur, 1842			
V.1.8	*Tholymi's tillarga* Fab,1798			
V4.9	*Cratilla lineata* Brauer	Last week of June to last week of Oct		
V4.10	*Trithemis festiva* Rambur,1842			
V4.11	*Pantala flavescens* Fab			
	Remarks	*Bio control agents*		

Table 9 Orthoptera

Sr. No.		Season	Habitat	Food-feeding
VI.1	**Tettigonidae**			
VI.1.1	*Euconocephalus incertulus* Walker	Throughout the year except from 1st week of May to 2nd week of June	On *Cynodon dactylon* in Community gardens, bushes and herbs of fragmented habitats, margins of field in Padra and Waghodia	Foliage of *C.dactylon*,plants of family asteracea, *Calotropis procera* and *C.Gigantia*
VI.1.2	*Mecopoda elongata* Linnaeus,1758			
VI.1.3	*Microcentrum rhombifolium* Saussure,1859			
VI.2	**Gryllidae**			
VI.2.1	*Gryllus domesticus* Linnaeus,1758	Throughout the year	In damp areas under rocks in gardens and fragmented habitats	Feeding on, *Andropogon martinii, Gerberas,* in gardens, natural and synthetic fabric in the houses.
VI.2.2	*Gryllus bimaculatus* Degeer,1773		In damp areas under rocks on margins of fields of Padra, Savli	Feeding on foliage of *Coccinia cordifolia, Lawsonia inermis*
VI.2.3	*Gryllus campestris* Linnaeus,1758			
	Remark	*Nuisance by shrill noices*		
VI.3	**Gryllotalpidae**			
VI.3.1	*Gryllotalpa fossor* Scudder,1869	Throughout the year	In burrows formed in fields of *Oryza sativa* in Dabhoi, in bushes and herbs in fragmented habitats	Devours roots and seedlings of herbaceous plants like *Amaranthus spinosus, Solanum nigrum.*
VI.4	**Acrididae**			
VI.4.1	*Acridium succintum* Linnaeus	Throughout the year except 1st week of May to 1st week of June	In all the fields 1.*A.succintum* on stem of *Oryza sativa*, on leaf of *Gossypium sp.*, 2.*A.melanocorne, T.didymus,T.pulcher*	*A.succintum, A.melanocorne, T.didymus,, T.pulcher, S.gregaria, H.banian, t.turrita, C.lugubris, C.tatarica, P.pictus* relish foliage of *Oryza sativa,*
VI.4.2	*Acridium melanocorne* Serville,1838			
VI.4.3	*Tylotropidus didymus* Thunberg			
VI.4.4	*Thisoicetrus pulcher* Bolivar ,1902			

Sr. No.		Season	Habitat	Food-feeding
VI.4.5	*Schistocerca gregaria* Forskål 1775		in *Triticum aestivum* fields 3.*S.gregaria, H.banian,T.turrita* on stems of *Oryza sativa* plant 4. *C.lugubris* on fallow lands of *Triticum aestivum* fields	*Gossypium sp, Triticum aestivum,*
VI.4.6	*Hieroglyphus banian* Fabricius 1798			
VI.4.7	*Trixalis turrita* Linnaeus,1758			
VI.4.8	*Crotogon lugubris* Blanch	Through out the year except 1st week of May to 1st week of June		
VI.4.9	*Cyrtacanthacris tatarica* Stoll 1813		On leaves of *Gossypium sp.* in fields of Dabhoi	Feeds on foliage of *Gossypium sp.*
VI.4.10	*Poikilocerus pictus* Fab,1775		On stem of *Gossypium sp.* and *Ricinus communis* in fields of Savli, on stems of *Calotropis* plant in fragmented habitat and residential areas	Relishes leaves and stems of *Gossypium* sp. and *Calotropis* plant

Table 10 Phasmida

Sr. No.		Season	Habitat	Food-feeding
VII.1	**Bacucunculidae**			
VII.1.1	*Megaphasma species*	Throughout the year	In hedges of fields in Padra and Savli. On herbs and shrubs of gardens	Feeds on foliage of herbs *Euphorbia neriifolia, E.tirucalli* and *Bougainvillea*
	Remarks	*Exhibit camouflage*		

Table 11 Dermaptera

Sr. No.		Season	Habitat	Food-feeding
VIII.1	Labiduridae			
VIII.1.1	*Labidura lividipes* Duff	2nd week of June to last week of Oct.	In leaf litter of agriculture fields, decaying vegetation of fragmented habitat, under stones in residential areas, in flowers of gardens. Comes to tube light at night in house.	Feeds on decaying vegetable matter, pollens, plant sap, collembolans.
VIII.2	Labiidae			
VIII.2.1	*Labia minor* Linn			

Table 12 Embioptera

Sr. No.		Season	Habitat	Food-feeding
IX.1	**Embiidae**			
IX.1.1	*Embia major* Imms 1913	2nd week of June to mid of Oct.	In silken webs and tunnels, under stones in Lalbaug, logs in Fragmented habitat and in the soil of Agricultural fields	Feeds on living or decaying plant material

Table 13 Dictyoptera

Sr. No.		Season	Habitat	Food-feeding
X.1	**Blattidae**			
X.1.1	*Periplaneta americana* Linnaeus,1785	Throughout the year	During the day, in cracks and crevices, of house, preferring dark moist sites in attics and basements. Active at night.	Eating almost anything including meats and grease, starchy foods, sweets, baked goods, leather, wallpaper paste, book bindings
X.1.2	*Stylopyga orientalis* Linnaeus 1758			
X.2	**Blattellidae**			
X.2.1	*Blattella germanica* Linnaeus,			
	Remark	*Domestic nuisance,contaminate food and kitchen utensils with excrement and salivary secretions and leave an unpleasant odor*		
X.3	**Mantidae**			
X.3.1	*Mantis religiosa* Linn,1758	1st week of June last week of Dec	Among bushes in *Sida acuta, Abutilon indicum* in fragmented habitat, on grass and *Chrysanthemum* flowers in gardens On *Caeselpenia crista, Annona squamosa* on margins of Padra and Waghodia, where they sit motionless in wait of their prey	Use their raptorial front legs to catch flies and other insects that come within reach
X.3.2	*Hierodula unimaculata* Olivier, 1792			
X.3.3	*Scizocephalus bicornis* Linnaeus			
X.3.4	*Gongylus gongyloides* Linnaeus,1758			
X.3.5	*Anaxarcha gramminea*			
	Remark	*Bio control agents*		

Table 14 Hemiptera

Sr. No.		Season	Habitat	Food-feeding
XI.1	**Cicadidae**			
XI.1.1	*Platypleura octoguttata* Fabricius, 1798	1st week of July to last week of Oct	On *Acasia nilotica* in ,Laxmivilas Palace compound ,in the bushes of *Lawsonia inermis* plantation on hedges of fields of Padra and Waghodia	Sucks the juices from the stem of *Acasia nilotica*
	Remark	*sometime pest of orchard ,causes nuisance by making shrill noise*		
XI.2	**Membracidae**			
XI.2.1	*Oxyrachis tarandus* Fabricius 1798	2nd week of june to last week of November	On *Cassia fistula in* gardens, *Albizia lebbeck* in residential areas and fragmented habitats, on *Acacia nilotica* in hedges of fields Always accompanied by ants	Sucks the juices from stem of *Acacia nilotica, Cassia fistula*
XI.2.2	*Leptocentrus taurus* Fab.		On stem of *Zizyphus mauritiana* in field hedges and on *Z. jujube* in fragmented habitats	Sucks the juices from stem of *Zizyphus jujube , Solanum melongena*
XI.3	**Cicadellidae**			
XI.3.1	*Idioscopus niveosparsus* Linnaeus	3rd week of March to 4th week of June.	On *Mangifera indica* trees in the margins of fields of Waghodia, Dabhoi. In private compound of new residential area and Sayajibaug.	Feeds on the sap of the young growing shoots and flowering shoots of *Mangifera indica*
	Remark	*Pest when really abundant, whole crop can be lost.*		

Sr. No.		Season	Habitat	Food-feeding
XI.3.2	*Nephotettix nigropictus* Stal 1870	Last week of Sept to 3rd week of March	On stems and leaves of *Oryza sativa* in Padra and Waghodia	Sucks sap of leaves of *Oryza sativa*
	Remark	*Vector of rice dwarf phytoreovirus*		
XI.4	**Aphididae**			
XI.4.1	*Aphis gossypii* Glover 1877	2nd week of Sept. to last week of Feb.	Colonies on leaves and stem of *Gossypium sp.* plant in Dabhoi, Savli, on stem of *Hibiscus sp.* in gardens.	Sucks sap from various parts of *Gossypium sp., Hibiscus sp.*, plants of family Cucurbitacea and *Solanum melongena*,
XI.4.2	*A.crassivora* Koch, 1854	2nd week of Sept. to last week of Feb.	Colonies on *Hibiscus rosa-sinensis* in botanical gardens, on *Cassia fistula* in university campus, on stem of *Helianthus annuus, Bougainvillaea spectabilis in* community gardens, *below* flowers of *Jasminum .* in New residential area ,on stem of *Solanum melongena* in Waghodia fields	Sucks the sap of *Cajanus cajan* and other Leguminous crops
XI.4.3	*A.nerii* Boyer de Fonscolombe 1841	2nd week of Sept. to last week of Feb.	Under leaves of *Calotropis procera* on road sides in residential area,on hedges of fields and gardens ,under leaves of *Ipomea palmate* in fragmented habitat	Feeds on sap of stems and leaves of plants from families Compositeae, Convolvulaceae, and Euphorbiaceae
XI.4.4	*Rhopalosiphum maides* Fitcher 1856		On stems ,leaves and fruit of *Zea mays, Triticum aestivum*	Sucks sap from all parts of the *Zea mays*
XI.4.5			Under leaves and on stems of vegetable	

Sr. No.		Season	Habitat	Food-feeding
	Myzus persicae Sulzer,1776		crop plants in Padra,on pods of *Gossypium* sp. in Dabhoi, under flowers and leaves of *Papavera somniferum* in botanical garden	Relishes sap from *Spinacea oleracea, Brassica oleracea, Raphanus sativus, Solanum melongena, Gossypium sp..*
	Remark	*Pest and vector of pea virus*		
XI.5	**Aleyrodidae**			
XI.5.1	*Bemisia tabaci* Gennadius, 1889	Last week of Aug to last week of Dec	On leaves of, *Raphanus sativus , Solanum melongena, Gossypium sp.*	
	Remark	*Transmit African cassava mosaic, bean golden mosaic, bean dwarf mosaic, bean calico mosaic*		
XI.6	**Fulgoridae**			
XI.6.2	*Kalidasa albiflos* Walker 1851	Through out the year	On stem of *Moringa oleifera* on margins of fields and compound in New city area.	Sucks the sap of stem of *Moringa oleifera*
XI.7	**Hydrometridae,**			
XI.7.1	*Hydromitra Vittata* Stal 1871	Through out year	Crawls on surface of ponds	Feeds on zooplanktons like Daphnia, Cyclops, and Typical prey includes midges, mosquito larvae, and water fleas.
XI..8	**Gerridae**			
XI.8.1	*Gerris tristan* Kirkaldy		Strides on leaves of *Nymphea, Utricularia* on surface of ponds, in *Oryza sativa* fields.	Small living or dead insects on the water surface
XI.9	**Belostomatidae**			
XI.9.1	*Belostoma indicum* Lept & Serv	Mid of June till late Oct.	In ponds and river streams of Vishwamitri. Comes in search of light at night from river streams	Prey upon *Bufo melanostictus*, small fishes and snails
XI.9.2	*Sphaerodema annulatum* Fab			

Sr. No.		Season	Habitat	Food-feeding
XI.10	**Nepidae**			
XI.10.1	*Laccotrephes maculatus* Fab	Throughout the year	In ponds of Lalbaug and botanical garden	Grabs on mosquito larvae
XI.11	**Reduviidae**			
XI.11.1	*Harpactor costalis* Stål, 1867	Mid of Sept. upto last week of Feb.	On stems of *Gossypium sp.* plant in Dabhoi and Savli and near by *Hibiscus* plant in gardens	Preys on *Dysdercus cingulatus*
XI.11.2	*Melenolestis picipes* Herrich Shaffer,1848	2nd week of June to last week of Sept.	Crawls under vegetation of *Sida acuta, Commelina nudiflora* in Laxmivilas palace , in grasses of *Cynodon dactylon* in community gardens and Waghodia	Feeding on *Pycnosoma species,,*
XI.11.3	*Acanthaspis siva* Distant 1904	Mid of June to late Feb.	On the crack in *Mangifera indica* tree on margin of Daboi and Savli fields, tree was having nest of *Apis indica*.Ocassionally found near house	Enemy of honey bee,*Apis cerena indica*
XI.11.4	*Prostemma flavomaculatum*	Mid of June to late Sept.	In *Mangifera indica* tree leaf litter in Dabhoi, Savli fields and Sayajibaug and in private compound of New residential area.	Not known
XI.11.5	*Onchocephalus annulipes* Stål, 1855	Throughout the year except in extreme cool weather conditions	On *Cynodon dactylon* in gardens, university campus, New residential area.Ocassionally comes to light in the house.	
	Remark	*Predators*		

Sr. No.		Season	Habitat	Food-feeding
XI.12	**Cimicidae**			
XI.12.1	*Cimex lectularius* Linn, 1758	Throughout the year	In human habitation of old city area	Feeds on human blood
	Remark	*Ectoparasite , Nuisance in house*		
XI.13	**Lygaeidae**			
XI.13.1	*Blissus gibbus* Fabricius	End of March to start of following years Jan.	Crawls amongst *Saccharum officinarum* plantation	Sucks sap from *Saccharum officinarum* stem
	Remark	Pest of *Saccharum officinarum*		
XI.13.2	*Lygaeus militaris* Fabricius 1775	2nd week of June upto mid of January of following year	On roadside plants of *Calotropis* in New residential area, in University campus, Laxmivilas palace, community gardens and on hedges of all fields	Sucks sap from stem and flower of *Gossypium sp. and Calotropis*
XI.13.3	*Lygaeus hospes* Fabricius1794			
XI.13.4	*Dieuches uniguttatus* Thunberg	Throughout the year except Dec. and Jan.	Found among vegetation of *Cynodon dactylon* in all the sites	Feeds on root sap of grasses.
XI.14	**Pyrrhocoridae**			
XI.14.1	*Dysdercus cingulatus* Fabricius1775	Throughout the year	On stem and flowers of *Hibiscus rosa chinensis* in gardens, on stem of *Gossypium sp.* in Waghodia and Savli on Malvaceous plant in Laxmivilas palace	Sap sucker of plans of family Malvacaea.
XI.14.2	*Antilochus coqueberti* Fabricius, 1803			Predates upon *Dysdercus cingulatus*
XI.15	**Coreidae**			
XI.15.1	*Riptortus linearis* Fabricius, 1775	Late Sept to late Feb. of following year	On *Tephrosia sp.* in fragmented habitat, on pods of *Cajanus cajan* in Padra and Waghodia	Feeds on the sap of seeds of *Cajanus cajan* and *Tephrosia sp.*

Sr. No.		Season	Habitat	Food-feeding
XI.15.2	*Cletus bipunctatus* Westwood, 1842	Post monsoon	On *Amaranthus* vegetation in fields and on flower of *Portulaca oleracea* in gardens	Sap sucker of *Amaranthus* and *Portulaca* stem
XI.15.3	*Cletomorpha raja* Distant, 1892	Early July to late Dec.	On *Tridax procumbans*, *Commelina nudiflora* leaves in laxmivilas palace	Sucks sap from plants where it inhabits
XI.15.4	*Anoplocnemis phasiana* Fabricius, 1781	Late August upto late February of the following year	On stem of *Solanum melongena* in Waghodia and on pod of *Cajanus cajan* in Padra	Feeds on sap of *Cajanus cajan* and fruits and stem of *Solanum melongena*
XI.15.5	*Clavigralla gibbosa* Spinola. 1837		On pods of *Cajanus cajan* in Padra and Waghodia fields and new residential area compound	Suck the sap from *Cajanus cajan* pods and stems
	Remark	*Pest of Cajanus cajan*		
XI.15.6	*Petillia lobipes* Westwood, 1842	Last quarter of July to early quarter of Dec.	Runs in the vegetation of *Viola odorata, Reseda odorata* in university campus	Feeds on wild vegetation. Where they live.
XI.15.7	*Petillia calcer*. Dallas, 1852			
XI.15.8	*Homoecerus variabilis* Dallas, 1852		Runs amongst vegetation of *Jussiaea perennis*,*Sida alba* on the margin of Dabhoi and Waghodia fields and also in Laxmivilas palace	Feeds on *Jussiaea perennis*, *Sida alba*
XI.15.9	*Homoecerus prominulus*. Fabricius			
XI.16	**Dinidoridae**			
XI.1.1	*Aspongopus janus* Fabricius, 1775	Late Feb to mid of June.	On stem of *Cucumis sativus* in fields of Padra, near some Cucurbitaceous plant in university campus	Sucks sap from stem of *Coccinea indica*,*Cucumis sativus*

Sr. No.		Season	Habitat	Food-feeding
XI.17	**Acanthosomatidae**			
XI.17.1	*Elasmostethus recurvum* Dallas	Post monsoon, winter	Crawls in vegetation of *Andropogon annulatus*	Sucks the sap of plants
XI.18	**Scutelleridae**			
XI.18.1	*Chrysocoris stolli* Wolff, 1801	Mid of June to late Oct.	Crawls amongst vegetation of *Clerodendron* near flow of Vishwamitri in University campus and Laxmivilas palace, resting on stem of *Croton sp.* in gardens	Feeds on *Clerodendron* and *Croton sp.*
XI.18.2	*Scutellera nobilis* Fabricius, 1775			
XI.19	**Plataspididae**			
XI.19.1	*Coptosoma cribrarium* Fabricius, 1798	Late Oct to early June	On the stem of *Dolichos lab lab* in fields of Padra,cluster gregariously	Feeds on sap from stem of *Dolichos lablab*
XI.19.2	*C. testaceum* Walker, 1867		Found on stem of *Sesbania grandiflora* in Laxmivilas palace and University campus	Feeds on *Sesbania grandiflora*
XI.19.3	*C. siamicum* Walker		Found near and on leaves of *Nephrolepis* in university botanical garden and garden of New residential area.	Feeding on Fern
XI.20	**Pentatomidae**			
XI.20.1	*Eysarcocoris montivagus* Distant	Late Aug late Dec.	On stem of *Giaillardia pinnatifida* in gardens , in New residential area ,on *Chenopodium album* in Padra field	Feeds on sap of weeds *Artemisia vulgaris, Morus alba*
XI.20.2			On stem of *Triticum aestivum* plant in fields, on *Andropogon martini* in Laxmivilas	Feeds on sap of Graminaceous plants

Sr. No.		Season	Habitat	Food-feeding
	Nezara graminae Fabricius, 1787	Mid of June to late Feb	palace and on *Cymbopogon annulatus* in New residential area,on *Cynodon dactylon* in Community gardens	
	Remark	Pest of *Triticum aestivum*,*Oryza sativa*		
XI.20.3	*Piezodorus rubrofasciatus* Fabricius, 1787	Mid of Aug to end of Dec.	*On Crotalaria spp in* university campus ,*Indigofera hirsute* in Laxmivilas palace ,*Trifolium sp* in Sayajibaug	Feeds on weeds *Crotalaria sp, Indigofera hirsute,Trifolium sp*
XI.20.4	*Halys dentatus* Fabricius, 1775		On stem of *Acacia nilotica* in laxmivilas palace, *Casuarina equisetifolia in* Sayajibaug, on *Mangifera indica* tree trunk in compound of New residential area, on *Ziziphus jujube* on hedges of Waghodia field.	Feed on the sap of small branches, and on tender shoots and leaves of *Acacia nilotica, Azadirachta indica, Casuarina equisetifolia, Mangifera indica* and *Ziziphus jujuba*
XI.20.5	*Podisus maculiventris* Say, 1832	Mid of June to late Sept	on leaves of Cucurbitacae in Padra fields new residential area., near *Michelia champaca* in botanical garden, on trunk of *Tectona grandis* in Laxmivilas palace	Predates on caterpillars of Pieridae and grubs of Chrysomelidae
XI.20.6	*Placosternum taurus* Fabricius, 1781		On stem of *Morus alba* in Laxmivilas palace	Sap sucker of *Morus alba*
XI.20.7	*Bagrada picta* Fabricius, 1775		On the stem of *Brassica* plant in *Triticum aestivum* field of Dabhoi and in Laxmivilas palace, ,	Sap sucker of stem of *Brassica* plant and *Brassica oleracea.*
	Remark	*Pest of Cruciferous plants*		

Sr. No.		Season	Habitat	Food-feeding
XI.20.8	*Plautia fimbriata* Fabricius, 1787	Mid of Aug to end of Dec.	On flowers of *Chrysanthemum , Helianthus annuus ,Canna sp, Lantana sp* in gardens	Feeds on the plants where it resides
XI.20.9	*Eucanthecona furcellata* Wolff, 1801		On the stem of *Crotolaria* in university campus and on margin of Padra field ,on stem of *Cassia fistula* in Sayajibaug ,near the flower of *Caeselpinea crista* in New residential area	Preys on larvae of, *Utetheisa pulchella, eurema hecabe, catopsilia pyranthe, Spodoptera litura*
XI.21	**Cydnidae**			
XI.21.1	*Cydnus indicus* Westwood 1837	Throughout the year except from 1st week of Dec. to April.	Crawls in grasses of *Cynodon dactylon and Andropogon martini in* all the study sites. comes to light in night in houses	Feed on roots of grasses.
XI.22.	**Lophopidae**			
XI.22.1	*Pyrilla perpusilla* Walker	2nd week of June to last week of Oct.	On leaves of *Saccharum officinarum, Zea mays, Triticum aestivum* in Dabhoi and Waghodia. Occasionally sighted in Residential areas, also observed on grasses in Gardens and fragmented habitats.	Feeds on sap of *Saccharum officinarum, Zea mays Triticum aestivum, Pisum sativum*
	Remark	*Pest of Saccharum officinarum*		

Table 15 Thysanoptera

Sr. No.		Season	Habitat	Food-feeding
XII.1	**Thripidae**			
XII.1.1	*Caliothrips indicus* Bagnall, 1913	Through out the year	On shoots of *Solanum melongena* in Waghodia field ,on earheads of *Triticum aestivum* in Dabhoi, on stem of *Crotalaria juncea* near flow of Vishwamitri in university campus,on flowers of *Sesbania aculeate,Chenopodium album* in Laxmivilas palace.	Feeds on buds, leaves, flowers, and fruit; of ,*Solanum melongena, Triticum aestivum, Crotalaria juncea, Phaseolus mungo, Sesbania aculeate,Chenopodium album*
XII.1.2	*Scirtothrips dorsalis* Hood		On tender shoots of *Ricinus communis* in Savli fields,on shoots and flowers of *Gossypium sp., Solanum melongena* in Waghodia fields, on stems of *Cassia fistula* near cricket ground of university campus ,on stems of *Acacia arabica* in Laxmivilas palace ,on flowers of *Helainthus annus* plant in Lalbaug.On stem of *Mangifera indica* tree in residential area of New residential area	Suck up the sap from the tender parts of stems of *Solanum melongena ,Gossypium sp., Ricinus communis, Helianthus annuus, Mangifera indica, Acasia arabica, Cassia fistula* etc.
XII.1.3	*Microcephalothrips abdominalis* Crawf		On flowers and shoots of *Chrysanthemum, Gerbera* in New residential area *Gaillardia aristata, G.pinnatifida* in community gardens, on flower of Daisy in Dabhoi field, on flower of *Cosmos sp.* in botanical garden of university campus,	Sucks sap from stems of plants from family Compositae
XII.1.4	*Isothrips orientalis*	April to Aug.	On flowers of *Jasminum sambac* in gardens	Sucks sap from Jasmine stem.
	Remark	*Pest of vegetable plants and ornamental plants*		

Table 16 Neuroptera

Sr. No.		Season	Habitat	Food-feeding
XIII.1	**Chrysopidae**			
XIII.1.1	*Chrysoperla carnia* Stephens	Mid June to last week of Sep.	Nocturnal, attracted to light. During day time *C.carnia* spotted on leaves of *Cynodon dactylon* in Sayajibaug and on *Oryza rufipogon, Amaranthus spinosus* in fields of Waghodia, Dabhoi. Larvae found on vegetation searching for food.	The larvae predates on insect eggs, thrips, mealybugs, immature of whiteflies and small caterpillars. Adult feed on pollen, nectar and honeydew
XIII.2	**Myrmeliontidae**			
XIII.2.1	*Palparus pardus* Rambur	Throughout the year	*P.pardus* and *B.abdominalis* found in sandy areas, on margin of fields in Dabhoi and Savli, Larvae excavate pits in the ground for catching ants.	Both adult and larvae feed on ants
XIII.2.2	*Brachynemurus abdominalis* Say, 1823			
XIII.3	**Ascalaphidae**		*Asclaphus sp and Helicomitus sp.* found on stems and twigs of *Ammania baccifera* in Padra fields and *Bougainvillea* plant in community gardens, larvae do not make pit falls but live concealed on the ground among stones, leaves, etc.	
XIII.3.1	*Ascalaphus Sp.*	Throughout the year except last week of Feb. to mid of June		Larva of *Asclaphus* predates on aphids, jassids etc Larva of *Helicomitus* also feeds on silver fish, caterpillars, etc
XIII.3.2	*Helicomitus Sp.*			
	Remark	*Larval stages predators ,they can be used as biocontrol agents.*		

Table 17 Coleoptera

Sr. No.		Season	Habitat	Food-feeding
XIV.1	**Carabidae**			
XIV.1.1	*Scarites bengalensis* Dejean, 1826	Through out the year except extensive cold climate	In litter below *Feronia lemonias* in Sayajibaug ,below small rocks in lowerbridge area of university campus and private compound in New residential area, on bark of *Tamarindus indicus* in margin of Padra	Feeding on grasshoppers and other Chrysomelid beetles
XIV.1.2	*S. subterraneus* Fab, 1785			
XIV.1.3	*Anthia sexguttata* Fab,1775		On bare soil amongst patches of vegetation of *Sida acuta, Acasia nilotica, Zizyphus* in fragmented habitat ,Padra and Waghodia fields	Feeds on caterpillars and pupae of Lepidopterans, adult grasshoppers, cockroaches, and beetles of Bostrychidae
XIV.1.4	*Calosoma orientalis*		Found on bark of *Aegle marmelos* of Sayajibaug ,*Saraca indica* in Lalbaug, amongst dense vegetation of *Nicotiana plumbegenifolia* in University campus near Vishwamitri stream, in the vegetation on margin of cricket ground in university campus ,on the ground in Laxmivilas palace ,under rocks on margin of Savli field ,on stem of *Nerium odorum* in old city area ,near vegetation on the margin of houses in new residential area.	Feed on various lepidopteran caterpillars. and locust
XIV.1.5	*C. pretiosus* Linn,1758			
XIV.1.6	*Chlaenius pictus*			
XIV.1.7	*C. rayotus* DeJean ,1826			
XIV.1.8	*C. nitidicolis*			
XIV.1.9	*C. nepalensis* Duft, 1812			
XIV.1.10	*C. duvaucelli* Bates,			
XIV.1.11	*Pheropsophus lineifrons* de Chaudoir			
XIV.1.12	*Casnonia bimaculata*			
XIV.2	**Cicindellidae**			
XIV.2.1	*Myriochila melancholica* Fab 1798		In sandy locality on margin of Dabhoi and Waghodia field, on ground in New residential area private	Feeds on ants

Sr. No.		Season	Habitat	Food-feeding
		Through out the year	compound .	
XIV.3	**Paussidae**			
XIV.3.1	*Paussus nauceras*		On ground where ant hole were seen in community gardens and botanical garden ,beneath stones in private compound of New residential area Attracted to light. Associated with ants.	Predaceous
XIV.4	**Haliplidae**			
XIV.4.1	Haliplus augustifrons Reg			Feeds on algae
XIV.5	**Dytiscidae**			
XIV.5.1	*Cybister punctatus*		Amongst the vegetation of *Hydrilla verticillata* and *Typha augustata* in ponds and in river stream of Vishwamitri in Sayajibaug ,comes at light	Grubs and adults are predaceous feeding on insects ,mollusks, tadpoles in the water including small fishes
XIV.6	**Hydrophilidae**			
XIV.6.1	*Hydrous indicus*		*H.indicus* comes to streetlight on the bridge passing on Vishvamitri near Sayajibaug	Grubs are predaceous feeding on small aquatic animals. Adults Feeds on decomposing vegetable matter
XIV.6.2	*Sternolophus rufipes* Fabricius, 1792		*S.rufipes* found in paddy fields .	Grubs and adults predator of mosquito larvae. In paddy fields ,it feeds on *Nephotettix virescens*
XIV.7	**Staphylinidae**			

Sr. No.		Season	Habitat	Food-feeding
XIV.7.1	*Paederus fuscipes* Curtis, 1826		Crawling in damp soil of fields and near Vishwamitri streams in University campus and Sayaji baug,comes to light at night	Grubs feeds on decaying organic matter and small organisms in the moist soil. Adults predates on leaf hoppers and plant hoppers, eggs and small moths
XIV.8.	**Scarabaeidae**			
XIV.8.1	*Heliocopris bucephalus* Fabricius, 1775	Through out the year	On dung in Sayajibaug ,New residential area lane ,surrounding Dabhoi and Savli fields , surrounding and inside cricket ground in university campus and also in Laxmivilas palace ground,making ball of dung and rolling it,either in pair or alone. Occasionally *G.miliaris* and *G.cyaneus* come to light at night	Feeds on cowdung ,human feces, various bird droppings and fungi
XIV.8.2	*Catharsius molossus* Linn1758			
XIV.8.3	*C. pithecus* Fab, 1775			
XIV.8.4	*Onthophagus gazella* F, 1787			
XIV.8.5	*O. bonasus* Fab, 1775			
XIV.8.6	*Gymnopleurus cyaneus* Fabricius, 1798			
XIV.8.7	*G. miliaris* Fab, 1775			
XIV.8.8	*Canthon* viridian			
XIV.8.9	*Oxycetonia versicolor* Fab, 1775	Jun to March	On rose stem in University botanical garden and private garden of New residential area	Pollens of rose flower
XIV.8.10	*Protaetia aurichalcea* Fab, 1775		Found on twig of Gaillardia Sp. in garden in front of Zoology department in University campus,	Pollen feeder
XIV.9	**Dynastidae**			

Sr. No.		Season	Habitat	Food-feeding
XIV.9.1	*Oryctes rhinoceros* Linnaeus 1958	Through out the year	On some decomposing matter under palms of *Borassus flabellifer* in Laxmivilas palace, near *Saccharum officinarum* field of Waghodia, near palms of *Oreodoxa regia* in Lal baug garden.under *Cocos nucifera* in New residential area.	Grubs feeds on decomposing vegetable matters and in soil rich in humus among plant roots
	Remark	*Pest of cocos nucifera and other palms,Saccharum officinarum*		
XIV.10	**Melolonthidae**			
XIV.10.1	*Holotrichia insularis* Brenske	Mid of June till end of Sept	*H.insularis* on leaves of Paddy in Padra and in *Saccharum officinarum* field in Waghodia	Grubs are subterranean root feeders. Adults feed on foliage of Paddy. *Saccharum officinarum*, etc.
XIV.10.2	*H. tuberculipennis*		*H.tuberculipennis* on stem of *Moringa oleifera*, near hedges of the fields in Padra on leaves of *lawsonia inermis,zizyphus jujube,* in hedges of Dabhoi ,near *Tamarindus indicus*, in Waghodia ,on leaves of *Acasia arabica* in Laxmivilas palace, on *Punita granatum* in botanical garden of University campus	
XIV.10.3	*Autoserica insanabilis*		On *Lawsonia inermis* on hedges of Padra.	
	Remark	*Pest of ,Saccharum officinarum and Paddy*		
XIV.11	**Buprestidae**			
XIV.11.1	*Sternocera chrysidioides* Castelnau & Gory, 1837	Mid of June to 1st	In Stems of *Acasia arabica* in Laxmivilas palace, on stem of *Zizyphus jujube* in old city area ,on trunk of	Grubs and adults bores in stems of dead
XIV.11.2	*S. nitidicolis* Castelnau & Gory, 1836			

Sr. No.		Season	Habitat	Food-feeding
XIV.11.3	*S. rugosipennis* Castelnau & Gory, 1837	week of October	*mangifera indica* tree in Sayajibaug ,on *Tecoma grandis* in University campus	or living plants
XIV.11.4	*Psiloptera cupreosplendens* Saunders	Aug-oct		
	Remark	*Wood borer*		
XIV.12	**Bruchidae**			
XIV.12.1	*Callosubruchus maculates* Fabricius, 1775	June to March	Visiting flowers and leaves of *Cajanus cajan* in the field of Padra and in stored pulse in houses	Adults and Grubs feed on seeds of *Cicer arietinum, Vigna unguiculata, V. radiata,*
	Remark	*Pest of stored pulses,both,in field crops and in stores*		
XIV.13	**Cerambycidae**			
XIV.13.1	*Batocera rufomaculata* DeGeer,1775	End of April-late Aug	On trunk of *Mangifera indica* tree in margin of Padra and Dabhoi fields and on stems of trees like *Albizia lebbeck*,, in Laxmivilas palace as well as *Ficus bengalensis,* near cricket ground of University campus ,on trunk of *Ficus glomerata* in New residential area,on *Dalbargia* in Sayajibaug.	Grubs of *B.rufomaculata ,X.globosa, A.saltator, P.ferrugineous, C.aedifactor, H.indicus, P.heroicus, M.crenata, G.hirta* wood borer bores into live or dead wood. , frass of wood near the stem was seen wherever they were found.
XIV.13.2	*Xystrocera globosa* Fab, 1775	Through out the year	On stem of *Acasia catechu* and *Albizia lebeck* in hedges of fields and fragmented habitats.	
XIV.13.3	*Apomecyna* saltator Fab, 1781	May- Sep.	On leaves of *Coccinia indica, Cucurbita moscheata,*	
XIV.13.4	*Plocaederus ferrugineus*	Mid of	Found under Sal tree, in University campus. On stem	

Sr. No.		Season	Habitat	Food-feeding
	Linnaeus,1792	April-late Nov.	of *Mangifera indica, Punita granatum* in the Waghodia and Padra fields.	
XIV.13.5	*Coptops aedificator* Fabricius, 1792	Late May-early Aug	On stem of *Acasia arabica, Aegle marmelos, Albizia lebbek*, of Laxmivilas palace, on *Butea frondosa*, in Sayajibaug, Ficus *glomerata* of residential area.	Adults, of *B.rufomaculata, X.globosa, A.saltator, P.ferrugineous, C.aedifactor, H.indicus, P.heroicus, M.crenata, G.hirta* feeds on flower, foliage , bark or stem Grubs of *A.rugicelis* bore into dry dead wood of logs and stumps
XIV.13.6	*Hypoeshrus indicus Gahan,*		On stem of Sal in fragmented habitats.	
XIV.13.7	*Acanthophorus rugicelis*		On wood of logs kept in University botanical garden	
XIV.13.8	*Prionus heroicus* Semv,1907		On stem of *Albezia lebbeck* in Laxmivilas palace	
XIV.13.9	*Macrotoma crenata* Voit 1778	June- Sep	Found on freshly felled trees of *Shorea robusta* in Sayajibaug garden,also under leaf litter	
XIV.13.10	*Gelonaetha hirta.* Fairmaire, 1850	Throughout the year	On stem of *Dipterocarpus sp.* and *Tectona grandis* in Laxmivilas palace	
	Remark	*Pest, wood borer*		
XIV.14	**Chrysomelidae**			
XIV.14.1	*Chrysolampra indica*	Mid of June to late Oct	On leaves of *Ipomea sp.*in gardens, on flower of *Hyphaena indica* in Laxmivilas palace and stem of *Tecoma stans* in University campus , private gardens of New residential area	Grubs of *C.indica, L.fortunei, A.foveicollis Aulacophora sp., S.clatrata ,O.bipunctata, A.coerulea* all feeds on leaves of the plant on which they are found.
XIV.14.2	*Lema fortunei* Baly, 1859	Late June to late Oct.	On leaves of *Salvadora persica* in fields hedges of Dabhoi and Padra	
XIV.14.3	*Aulacophora foveicollis*	April-Oct.	Found on leaves of Cucurbitacae in Padra, on stem of *Dalbergia latifolia*, in Laxmivilas palace, leaves of	
XIV.14.4	*Aulacophora sp.*			

Sr. No.		Season	Habitat	Food-feeding
			Michelia champaca in botanical garden.	
XIV.14.5	*Sindia clathrata* Fab, 1798	Mid of June to early Nov.	On leaves of Cucurbitaceous plants in Padra	Grubs of *S.emperya* feed on roots of climbers
XIV.14.6	*Oides bipunctata* Fab, 1781		On the leaves of common wild creeper *Vitis trifolia*	
XIV.14.7	*Altica coerulea*		Mostly found on ornamental plants in gardens ,on leaves of *Ixora rubiacea ,Canna indica ,I.coccinea*	
XIV.14.8	*Sagra empyrea* Lacordaire, 1845		On *Quisqualis indica* in Sayajibaug and on *Cuscuta sp.* in Laxmivilas palace	
XIV.15	**Cassididae**			
XIV.15.1	*Aspidomorpha* Sp.	Mid of June to late Dec.	On leaves of *Ipomea* in hedges of fields and in gardens	Grubs and adult feed on the leaf of *Ipomea*
XIV.15.2	*Aspidomorpha diformis*			
XIV.15.3	*Cassida piperata* Hope, 1842		Generally on leaves of Cryophyllus, in University botanical garden, on leaves of *Abutilon indicum* in Sayajibaug.	
XIV.15.4	*Glyphoeossis trilineata*			
XIV.15.5	*Conchyloctania nigrovittata*			
XIV.16	**Curculionidae**			
XIV.16.1	*Pycnodactylus hypocrita* Chevrolat, 1873	Through out the year	On leaves of *Commelina nudiflora* in Sayajibaug and University campus	Feeding on leaves and other parts of plants or on plant sap
XIV.16.2	*Sitophilus oryzae* Linnaeus, 1763		In stored rice in the house.	larvae lives and feeds inside the grain hollowing it out
	Remark	*Pest of stored grains*		
XIV.16.3	*Xanthochelus superciliosus* Gyllenhal, 1834	Through out the year	On stem of *Zizyphus* in field hedges and fragmented habitats.	Feeding abundantly on *Zizyphus* fruits and leaves.
XIV.16.4	*Apion aeneum* Fabricius, 1775		In *Cajanus cajan* fields of Padra and New residential	Feeds on *Cajanus cajan* plant.

Sr. No.		Season	Habitat	Food-feeding
			area	
XIV.16.5	*Cyrlozernia dispar*		Found on stem of *Crotalaria medicagenia* in University campus, Laxmivilas palace,	Feeds on seeds and leaves of *Crotalaria*
XIV.17	**Elateridae**			
XIV.17.1	*Agrypnus fuscipes* Fabricius, 1775	May- Aug.	In *Lawsonia inermis* stems on field margin of Waghodia	Grubs feeds on Scarabs, caterpillars and pupae of Lepidoptera. Adult predaceous as well as sap feeder.
XIV.18	**Cantharidae**			
XIV.18.1	*Sybaris testaceus*	June to Dec	On flowers of *Lantana camara, Calandulla* in gardens.	Larvae feeds on small caterpillars Adult are nectar feeders
XIV.19	**Silvanidae**			
XIV.19.1	*Oryzaephilus surinamensis* Linnaeus, 1758	Throughout the year	In stored rice and *Triticum aestivum* flour in house,	Grubs and adult feeds on stored *Oryza sativa* and *Triticum aestivum*
	Remark	*Stored grain Pest*		
XIV.20	**Bostrychidae**			
XIV.20.1	*Synoxylon anale* Lesne, 1897	Throughout the year	In stem of *Acacia arabica* in hedges of Savli field, on stem of *Albizia lebbek, Cassia fistula, Pongamia glabra, Ziziphus jujube* of Laxmivilas palace.	Adult and grub, feed on wood
	Remark	*Pest of wood*		
XIV.20.2	*Rhyzopertha dominica* Fabr,1792	Throughout the year	In stored grains and flour in houses.	Grubs feed on *Oryza sativum* and *Triticum aestivum* grains.
	Remark	*Pest of stored grains*		

Sr. No.		Season	Habitat	Food-feeding
XIV.21	**Anobiidae**			
XIV.21.1	*Lasioderma testaceum* Duft	Throughout the year	In turmeric which was left unused for several months in the house	Feeds on turmeric
	Remark	*Pest of tobacco, spices like turmeric.*		
XIV.22	**Coccinellidae**			
XIV.22.1	*Coccinella septumpunctata* Linnaeus 1758	Mid of June to late Nov.	On *Hibiscus rosa-sinensis* in botanical gardens, on *Cassia fistula* in University campus, on stem of *Helianthus annuus, Bougainvillaea spectabilis in* community gardens, below flowers of *Jasminum* sp. in New residential area, on stem of *Solanum melongena* in Waghodia fields	Predator of *Aphis crassivora*
XIV.22.2	*Coccinella transversalis* Fabricius, 1781		On stem of *Dianthus* in botanical garden,on stem of *Nerium* in New residential area and also in Raddish stem in Padra	Predator of *Aphis nerii, A.crassivora, Myzus persicae*, small hoppers and small larvae.
XIV.22.3	*Harmonia octomaculata*			
XIV.22.4	*Chilocorus subindicus* Booth		Attracted to light in homes of New residential area	Predator of coccids
XIV.22.5	*Thea/illeis indica* Timberlake		On stems ,leaves and fruit of *Zea maize* in Waghodia ,on *Cynodon dactylon* in community gardens	Predator of Aphids
XIV.22.6	*Anegleis cardoni* Weise		*Helianthus annuus, Bougainvillaea spectabilis in* gardens ,on *Cajanus cajan* pods in Padra field	Predator of *Aphis crassivora*
XIV.22.7	*Chilomenes / Menochiles sexmaculata* Fab.1781		Under leaves and on stems of *Brassica oleracea* and *Solanum melongena* in Waghodia , and Padra ,under flowers and leaves of *Papavera somniferum* in	Predator of *A.nerii, Myzus persicae*

Sr. No.		Season	Habitat	Food-feeding
			botanical garden	
XIV.22.8	*Brumoides* suturalis		On leaves of *Gossypium sp., Solanum melongena, Brassica oleracea, Raphanus sativum* in fields	Predator of nymphs and pupae of *Bemisia tabacii,Aphis nerii, A.crassivora, Myzus persicae*
	Remark	*Biocontrol agent*		
XIV.22.9	*Henosepilachna vigintioctopunctata*		On stem of *Solanum melongena* in Waghodia field, on leaf of a Cucurbit plant in University campus.	Feeds on fruits and foliage of *Solanum melongena* and *Coccinea sp.*
	Remark	Pest of Solanaceous and Cucurbitaceous plants		
XIV.23	**Tenebrionidae**			
XIV.23.1	*Tribolium castaneum*	Throughout the year	In stored *Triticum aestivum ,Zea maize* in the house	Feeds on grains and other stored food items
XIV.23.2	*Tribolium confusum*		In unused dryfruits and nuts kept for long time. in *Triticum aestivum* flour in the house	
	Remark	*Pest of stored grains,*		
XIV.23.3	*Platynotus excavatus*	Throughout the year	In leaf litter under *Mangifera indica* tree, *Cassia fistula,* in fragmented habitats and on margin of fields.	Feeding on rootlets and decaying vegetation
XIV.23.4	*Pseudoblaps mellyi*			
XIV.23.5	*Blaps orientalis*			
XIV.23.6	*Gonocephalum dorsogranosum*			
XIV.23.7	*Gonocephalum planatum*			
XIV.23.8	*Rhytinota impolita*			
XIV.24	**Meloidae**			
XIV.24.1	*Cyaneolytta coerulea*		Found on *Cynodon dactylon* in all the sites	Grubs feeds on egg masses of

Sr. No.		Season	Habitat	Food-feeding
XIV.24.2	*Psaldolytta menoni*	Mid of June to late Nov.	Found on rice leaves in Padra and Waghodia.	grasshoppers and bees of families Megachilidae and Andrenidae
XIV.24.3	*Mylabris pustulata*		On flower of *Hibiscus rosa chinensis* in gardens. On leaves of crop plants in fields. if handled the adults exudes an acrid yellow fluid containing cantharidin due to which blister occur on the skin	Adults feeds on flowers and young leaves of plants Malvacea, Cucurbitacae, Leguminocea family
	Remark	*Pest*		
XIV.25	**Dermestidae**			
XIV.25.1	*Trogoderma granarium*	Throughout the year	In stored *Triticum aestivum,* nuts, pulses, spices of house	Grubs feed on stored *Triticum aestivum,* nuts, pulses, spices
	Remark	*Pest of stored Triticum aestivum. ground nuts, pulses, spices*		
XIV.25.2	*Attageus piceus*	Throughout the year	In blankets and woollen clothes kept in houses	Grubs feed on feathers, hair and wool Adult, nectar feeders
	Remark	*Pest of fur and woollen clothings in house*		

Table 18 Diptera

Sr. No.		Season	Habitat	Food-feeding
XV.1	**Culicidae**			
XV.1.1	*Culex Sp.*	Throughout the year except in months of extreme heat or cold.	Flying on pond in Lalbaug ,and botanical garden, hovering on puddles in Residential areas, from containers with little water in the outhouse of house in field of Padra and *Ficus religiosa* tree holes in Laxmivilas palace compound	Larvae are filter feeders, consuming aquatic bacteria and other microorganisms Blood-feeding females. Males sip nectar, honeydew and fruit juices
	Remark		*Vectors for parasites causing Elephantiasis*	
XV.1.2	*Anopheles Sp.*		flying on puddles and in vegetation everywhere	
	Remark		*Vectors of Malaria*	
XV.1.3	Aedes *Sp.*		Flying on artificial collection of water near and in human habitat, in shallow tanks, drains, gutters.	
	Remark	*Vectors of Dengue and Yellow fever*		
XV.2	**Stratiomyidae,**			
XV.2.1	*Pachygaster Sp.*	From early April to late Nov.	Flying on *Calotropis* flowers in damp and shady places near Viswamitri in University campus	Larvae feed on various decaying substances found under bark of tree
XV.2.2	*Hermatia illucens* Linn,1758		Hover on decaying animal and vegetable matter around fields and fragmented habitats	Larvae feed on compost, dung, rotting vegetation
	Remark	*Larvae sometimes cause Intestinal myiasis in humans*		
XV.2.3	*Sargus metallinus* Fab,1805	From early April to late Nov	Hover on some Umbelliferous flower in botanical garden ,on vertebrate dung on shady places near flow of Viswamitri in University campus	Larvae feed on algae, decaying organic matter or on other aquatic organisms
XV.2.4	*Wallacea argentea*			

Sr. No.		Season	Habitat	Food-feeding
	Doleschall, 1858			
XV.3	**Tipulidae**			
XV.3.1	*Conosia irrorata* Wiedemann,1828	June to Dec	On bark of *Azadirechta* tree near cricket ground in University campus ,on stem of *Delonix regia* in Sayajibaug garden	Larvae, feed on plant roots in gardens and farmland
XV.4	**Psychodidae**			
XV.4.1	*Telmatoscopus albipunctatus* Willistone	Throughout the year	Adults rest on bathroom walls in the houses of residential areas and on damp walls of houses near fields.	Larvae feed on decaying organic matter Adult feed on moisture.
	Remark	*Larvae can cause Intestinal myiasis in human*		
XV.5	**Tabanidae**			
XV.5.1	*Chrysops dispar* Fab,1794	Feb till Oct.	Hovering near cage of deer in zoo of Sayajibaug, on cattles around fields	Female sucks blood of cattle, dogs, man. Female can also subsist on vegetarian diet if they are unable to get blood Males live on nectar or the juices of the plants and fruits,
XV.5.2	*T. rubidus* Wiedemann, 1821		From lower parts of the back and hindlegs of cattles moving in University campus and around fields	
XV.5.3	*T. striatus* Fabricius, 1787		From underside of abdomen of cattle moving around field.	
XV.5.4	*Tabanus lineola*		Resting in verandah of house in residential areas where dogs are found.	
	Remark	*Transmit various deseases such as Anthrax, Trypanosomiasis of animals*		

Sr. No.		Season	Habitat	Food-feeding
XV.6	**Asilidae**			
XV.6.1	*Philodicus femoralis* Ricardo, 1921	Throughout the year	On twigs of *Glycine abrus* in hedge of Padra and Savli fields, flying in botanical garden and community gardens.	Adult robber flies predates upon other flies, beetles, butterflies and moths, various bees, dragon and damselflies, ichneumon wasps, grasshoppers, and some spiders.
XV.6.2	*Promachus duvancelii*			
XV.6.3	*Allocotasia aurata* F, 1794			
XV.7	**Bombyliidae**			
XV.7.1	*Argyramoeba distigmata*	End of July to end of April of following year	On flower of *Papaver paniculata penniculata* in botanical garden, in *Gaillardia aristata* and *G. pinnatifolia*.in community gardens and private garden in New residential area.	Larvae are parasitic on larvae of solitary bees like *Anthophora* and fossorial wasps like *Eumenes.* Adult nectar feeders
XV.8	**Dolichopodidae**			
XV.8.1	*Condylostylus Sp.*		Common in lightly shaded areas near streams in University campus, also near cricket ground on leaf litter of *Ficus benghalensis*, *F.glomerata* in gardens and residential areas.	Adults and larvae are predaceous on small insects.
XV.8.2	*Heteropsilopus or Sciapus Sp*			
XV.9	**Hippoboscidae**			
XV.9.1	*Hippobosca variegata* Megerle, 1803	Throughout the year	Commonly found on cattle around field and dogs in residential areas.	Adults and larvae are blood suckers.
	Remark	*Ectoparasites of birds and mammals*		
XV.9.2	**Syrphidae**			
XV.9.3	*Sphaerophoria scutellaris*	Mid of June to	Adult flies can be found hovering around flowers of *Gerbera, Canna* in gardens	Larvae searching for aphids, small caterpillars, thrips

Sr. No.		Season	Habitat	Food-feeding
		end of December	On *Lawsonia inermis* in margin of fields	Adult feeding on nectar and pollen.
XV.9.4	*Helophilus bengalensis*		In wet fermenting woody pulp of some tree in Sayajibaug , nearby flow of Vishwamitri	Larva feeds on maggots of other Sp. of Diptera,
XV.10	**Muscidae**			
XV.10.1	*Musca domestica* Linnaeus, 1758	Throughout the year	Fluttering in homes ,develop in garbage	Feed on liquid substances beside solid material which has been softened by saliva
	Remark	*Vector for Typhoid, Cholera, Diarrhea, Dysentery, Poliomyelitis, Leprocy*		
XV.10.2	*Pycnosoma flaviceps*	Throughout the year	Hovering on *Calotropis* flowers	Larvae feeds on decaying vegetation , Adults nectar feeders.
XV.10.3	*Stomoxys calcitrans* Linnaeus, 1758		Commonly seen in the sun shine on fences, posts and boards in all the sites.	Both males and females are vicious blood suckers of cows and other animals
	Remark	*Anthrax may be transmitted by this insect*		
XV.10.6	*Ochromyia jejuna*	Throuout the year	In the field of Dabhoi near termiterium	Adults feeds on swarming termites and ants
XV.11	**Calliphoridae**			
XV.11.1	*Lucilia illustris* Meigen, 1826	Throughout the year	On *Calotropis* flower in University campus ,on human excrement near Padra field., also co existed with *Sarcophaga* on flesh of Squirell ,	Larvae feed only in decaying flesh or other animal matter. Adult feeds on flowering plants
	Remark	*Bores into flesh causing cutaneous myiasis in sheeps. Vector of Clostridium botulinum in pheasants. Maggot Debridement Therapy (MDT) uses selected fly larvae for the cleansing of non-healing Gangrenous wounds*		
XV.12	**Sarcophagidae**			
XV.12.1	*Sarcophaga lineaticollis* Macq	Throughout the year	On dung in ground of Laxmivilas palace.Decaying flesh of squirrel and mouse in residential areas	Larvae eat decaying organic matter Adults feed on nectar, sap, fruit juices

Sr. No.		Season	Habitat	Food-feeding
	Remark	Causes myiasis in sheep		
XV.13	**Diopsidae**			
XV.13.1	*Sphyracephala hearseyana*	Late June to late Dec.	On leaves of Cucurbitaceous plant in damp places near riverflow in University campus.	Feed on fungi and bacteria on decaying vegetation
XV.14	**Drosophilidae**			
XV.14.1	*Drosophila melanogaster* Meigen, 1830	Throughout the year.	Most common around decaying or fermenting fruits in dust bin of houses and in fields	Larvae burrow in the decaying fruit and feed on the yeast growing there.
	Remark	*employed extensively in the study of animal genetics*		
XV.15	**Tephritidae**			
XV.15.1	*Dacus/Bactrocera dorsalis* Hendel 1912	Throughout the year	On some fruits of cultivated vegetables in fields also found in groups under leaves in dense vegetation near river flow in University campus.	The larvae feed on fruits
	Remark	*Pest of fruits of cultivated vegetables*		
XV.16	**Agromyzidae**			
XV.16.1	*Melanagromyza obtusa* Malloch 1914	Late Oct to late March.	flying on *Cajanus cajan* pods and flowers in fields and private compound in New residential area	Maggots feed on stem, roots, developing seeds in the pod of *Cajanus cajan*
	Remark	*Pest of cultivated Cajanus cajan*		

Table 19 Lepidoptera

Sr. No.		Season	Habitat	Food-feeding
XVI.1	**Yponomeutidae**			
XVI.1.1	*Plutella maculipenis* Curt.	Early Nov to late March	On *Brassica oleracea* leaf in Padra field,	Larvae feeds on Cruciferous plants
	Remark	*Major pest of Cruciferous plants*		
XVI.1.2	*Atteva niveigutta* Walker,	Throughout the year	On leaf of Cassia Sp. in fragmented habitats.	Larvae Feeds on leaves
	Remark	*Minor pest of Cassia sp.*		
XVI.2	**Gelechiidae**			
XVI.2.1	*Platyedra gossypiella* Saunders	Throughout the year	On leaf of *Gossypium sp.* plant in Dahoi field, flying near *Hibiscus* plants in gardens.	Caterpillars feed on *Gossypium sp., Hibiscus* and other Malvaceous plants
XVI.3	**Pyralidae**			
XVI.3.1	*Glyphodes / Eudioptes Indica* Saunders, 1851	Late March to mid of June	On the leaf of *Coccinea* in Padra field, also in private compound in New residential area	larvae usually feed on leaf of *Coccinia indica*
XVI.3.2	*Nausinoe geometralis* Guenée, 1854	From late Feb to late June	In gardens, near vegetation of Jasmine	Larvae feeds on leaves of *Jasminum sambac*
XVI.4	**Pyraustidae**			
XVI.4.1	*Scirpophaga auriflua* Zeller, 1863	Throughout the year	On *Saccharum officinarum* stem in Waghodia fields.	Feeds on midrib of Saccharum *officinarum* leaves.
	Remark	*Pest of Saccharum officinarum*		
XVI.5	**Nymphalidae**			
XVI.5.1	*Ariadne ariadne* Johanssen	Throughout the year	Fluttering on leaves of *Ricinus communis* in Savli fields and in fragmented habitats	Larvae feed on *Ricinus communis*, adult nectar feeders.

Sr. No.		Season	Habitat	Food-feeding
XVI.5.2	*Junonia/Precis orithya* Linnaeus,1758	Mid of June to late Dec.	Fluttering on stony uncultivated grounds of Laxmivilas palace and on roads of New residential area	Larvae feed on common weed *Justicia sp.*
XVI.5.3	*J.almana* Linnaeus, 1758		Settles on rubbish or dead leaves, in community garden , in New residential area,in paddy field	Larvae feed on leaves of paddy.
XVI.5.4	*J.lemonias* Linnaeus,1758		On *Nelsonia* leaf in Laxmivilas palace and *Sida rhombifolia* in dense vegetation of lowerbridge	Larvae feed on leaves of *Nelsonia and Sida.*
XVI.5.5	*Acraea terpsicore* Linnaeus,1758	Late July to late Dec.	Frequent visitor to gardens in New residential area and Sayajibaug	Not known
XVI.5.6	*Hypolimnas missipus* Linnaeus,1769	Late June to late Dec	On *Portulaca oleracea and Hibiscus* in garden of New residential area ,*Abutilon sp.* in University campus,	Larvae feed on leavesof *Portulaca , Abutilon , Hibiscus*
XVI.5.7	*H.bolina* Drury,1773		*Portulaca oleracea* in all the fields and gardens	Larvae feed on *Portulaca oleracea.*
XVI.5.8	*Vanessa cardui* Linnaeus,1758	Late August to 1st week of Jan.	Fluttering near vegetation of *Zornia diphylla ,Butea frondosa,*in fragmented habitats	Larvae feed on leaves of *Z.diphylla* , plants from Asteracea and Fabacea
XVI.5.9	*Danais chrysippus* Linnaeus,1758	Late August to late Feb.	On vegetation of *Calotropis* sp in University campus, field margins, lanes of New residential area, on *Asclapias sp* in Laxmivilas palace.	Larvae feeds on leaves of *Calotropis* and *Asclapias* sp.
XVI.5.10	*Danais melissa* Cram.			
XVI.5.11	*D. limniace* Butler,1866			
	Danais genutia,Cr 1779		*On flowers of Lantana, Cosmos.*	Larvae feed on *Lantana,*Cosmos
XVI.5.12	*Euploea core* Cramer,1780	Late July to late Dec.	In all study sites	Larvae feed on leaves of *Ficus benghalensis* and several Asclepiads, *Hemidesmus*

Sr. No.		Season	Habitat	Food-feeding
				indicus, Nerium odorum
XVI.5.13	*Melanitis leda* Linnaeus,1758	Late July to late Oct.	During the day time it shelters in undergrowth of fields, among bushes in fragmented habitats, in verandahs of houses in residential areas. At dusk it comes out in the air and dances in rapid jerky way.	Larva feeds on Graminaceous plants.
	Remark	*Adult pollinators,Caterpillars phytophagous*		
XVI.6	**Pieridae**			
XVI.6.1	*Colotis danae* Fab.1775	Late June to late March.	Fluttering on *Cassia fistula* vegetation in University campus and community gardens, in *Brassica oleracea* fields of Padra.	Larvae feed on leaves and flowers of Cassia, *Brassica.*
XVI.6.2	*C.amata* Fab.1775		In vegetation having *S.persica* in University campus and Laxmivilas palace	Larvae feeds on leaves of *Salvadora persica*
XVI.6.3	*C. vestalis* Butler 1876			
XVI.6.4	*Anapheis aurata* Fabricius, 1793	Late August late Dec	In vegetation of *Capparis Sp.* in Laxmivilas palace, Sayajibaug, New residential area.	Larva Feeds on *Capparis sp.*
XVI.6.5	*Delias eucharis* Drury	Througout the year	In all the study sites.	Feeds on the Loranthus on the trees,
XVI.6.6	*Catopsilia pomona* Fab	July to late Feb		*Cassia fistula, Butea monosperma, C.tora, C.occidentalis, Bauhinia racemoses.*
XVI.6.7	*C. crocale* Cramer 1775			
XVI.6.8	*C. pyranthe* Linn,1758			
XVI.6.9	*Ixias pyrene* Linn,1764	Mid of June to late Dec	In vegetation of *Capparis sp.* in New residential area, fragmented habitats,	Larvae feed on *Capparis sp.*
XVI.6.10	*I. marianne* Cram,1779			
XVI.6.11	*Hebomoia glaucippe* Linn			

Sr. No.		Season	Habitat	Food-feeding
XVI.6.12	*Eurema hecabe* Linn,1758	Throughout the year	In all study sites	*Larvae feeds on C.fistula, Pithecellobium dulce, Albizia Sp., Sesbania aculeate, Caeselpinia Sp.*
XVI.6.13	*Cepora nerissa* Fab,1775	June to Sept.	In vegetation of *Capparis sp.*in all sites.	Larvae feeds on *Capparis sp.*
XVI.7	**Papilionidae**			
XVI.7.1	*Graphium agememnon* Linnaeus,1758	Throughout the year	On Annona squamosa in old city area, on *Polyalthia longifolia* in front of Zoology department, on *Michelia champaca* in botanical garden, in New residential area ,on vegetation surrounding Padra fields.	Larvae feeds on *Annona squamosa, Polyalthia longifolia, Michelia champaca*
XVI.7.2	*Papilio demoleus* Linnaeus,1758	Throughout the year	Near *A.marmelos* in Laxmivilas palace and Sayajibaug.On *M.koinigii* in New residential area and old city, *Z.jujube in* all the field margins.	Larvae feeds upon leaves and shoot tips of *Aegle marmelos, Murrya koenigii, Z. jujube*
XVI.7.3	*Papilio polytes* Linnaeus,1758			
XVI.7.4	*Pachliopta aristolochiae* Fabricius,1775	Mid of June to late February	On vegetation of *A.indica* in Sayajibaug and on *Quisqualis indica* in New residential area and botanical garden.	Larvae feeds on *Aristolochia indica*
XVI.7.5	*P.hector* Linn.1758			
XVI.8	**Lycaenidae**			
XVI.8.1	*Tarucus extricatus*	Throughout the year	Under plant of *Z.jujube* in all the field margins and in fragmented habitats.	Larvae feeds on leaves and fruits of *Zizyphus jujube*
XVI.8.2	*T.theophrastus* Fab,. 1793			
XVI.8.3	*T.nara* Kollar, 1848			
XVI.8.4	*Chilades lajus* Stoll,1780	Sep to Feb	On *Cynodon* in botanical garden.	Larvae feed on Orange, lime

Sr. No.		Season	Habitat	Food-feeding
XVI.8.5	*Lampides boeticus* Linn.	Late August to late March	On leaves of *Cajanus cajan* in fields of Padra and in New residential area, under tree of *B.frondosa* in gardens and fragmented habitats..	Larvae feeds on pods of gram, and *Butea frondosa* .
XVI.8.6	*Catochrysops strabo* Fab			
XVI.8.7	*Euchrysops cnejus* Fab			
XVI.8.8	*E.pandava* Godfrey,1927		On leaves of *B.retusa* in fragmented habitats..	Feeds on *Bauhinia retusa*
XVI.8.9	*Pseudozizeeria maha*	June to late Sep	On *O.corniculata* in all the study sites.	Feeds on *Oxalis corniculata*
XVI.8.10	*Zizula hylax* Fab,1775	June to late Dec	On flowers of *R.tuberosa* in botanical garden.	Feeds on *Ruellia tuberosa*
XVI.8.11	*Zizeeria karsandra* Moore,1865	Throughout the year	Mostly in vegetation of fragmented habitats.	Feeds on *Zornia diphylla*, *Amaranthus viridis*, *Melilotus indica*, *Medicago sativa*, , *Trifolium alexandrinum*
XVI.8.12	*Zizina otis* Fabricius,1787	Throughout the year	On *M.pudica* in all the gardens, *Z.diphylla*, *S.aculeata* in fragmented habitats.	Feeds on *Mimosa pudica* , *Zornia diphylla, Sesbania aculeata, Alysicarpus vaginalis*
XVI.8.13	*Freyeria trochilus*	Late Sep to late March	On leaves of *Heliotropium* in Padra and Dabhoi fields.	Feeds on Pea pods, *Heliotropium sp.*
XVI.9	**Hesperiidae**			
XVI.9.1	*Parnara/Pelopidas mathias* Fabricius,1798	Late Aug to late March	On leaves of paddy in Padra, on grass near *Saccharum officinarum* field in Waghodia, on corn of *Zea maize* in Dabhoi.	Feeds on leaves of Rice ,*Zea maize, Saccharum officinarum*
XVI.10	**Sphingidae**			
XVI.10.1	*Acherontia styx* Moore,1858	Throughout the year except in month of May and Jan.	On *Clerodendron Sp.* in Laxmivilas palace, on Solanum melongena leaves in Waghodia field.	Larva feeds on *Clerodendron spp, Vitex nigundo,* wild creepers, *Solanum melongena* Adult are known to suck honey from beehives.

Sr. No.		Season	Habitat	Food-feeding
XVI.10.2	*Harse/Agrius convolvuli* Linnaeus, 1758	Throughout the year except in month of May and Jan.	Occasionally visits house in New residential area, found in Padra field's margin near Hibiscus plantation.	larvae feeds on *Phaseolus mungo,* sweet potato and on convolvulus creepers adults feed on nectar of flowers of ,*Hibiscus, Ipomia, Begonia*
XVI.10.3	*Hippotion celerio* Linn,1758		On the leaf of *Gossypium sp.* in Dabhoi and Savli fields.	Larva Feeds on leaves of *Gossypium sp.* and cause a certain amount of defoliation
XVI.10.4	*H.rosetta* Swinhoe, 1892		On *Cynodon dactylon* in fields of Padra and Dabhoi	Larva feeds on *Borreria*
XVI.10.5	*Nephele hespera*		Occasional visitor of house in New residential area	Not known
XVI.10.6	*Daphnis nerii* Linn,1758		On plant of *Nerium* in garden in front of zoology department, near my house in New residential area, and in old city.	Larvae feeds on leaves of *Nerium odorum*
XVI.10.7.	*Theretra nessus* Drury 1773		In shrubs of *Boerhavia* in Waghodia field margin.	Larvae feeds on leaves of *Boerhavia*
XVI.10.8	*Psilogramma menophron* Cramer, 1780		Occasional visitor of house in New residential area. In gardens with *Nyctanthus* vegetation	Feeds on *Nyctanthes, Vitex nigundo*
XVI.11	**Geometridae**			
XVI.11.1	*Chiasmia eleonara* Cram.	Throughout the year	Occasional visitor in house in New residential area.	Not known
XVI.11.2	*Thalassodes dissita* Walker,1861		On margin of field in Waghodia and Savli under *Mangifera indica* trees	Larva Feeds on *Mangifera indica* leaves

Sr. No.		Season	Habitat	Food-feeding
XVI.12	**Aganaidae/ Hypsidae**			
XVI.12.1	*Asota/Hypsa ficus* Fab.	Throughout the year	Near *F.glomerata* in New residential area and *F.bengalensis*, near cricket ground in University campus.	Larvae defoliate *F.glomerata,* also feed on leaves of *Ficus bengalensis*, F.religiosa.
XVI.12.2	*A./H.iodamia* Herrich-Schäffer, 1854			
XVI.13	**Noctuidae**			
XVI.13.1	*Ophideres/Othreis /Eudocima fullonia* Linnaeus 1758	Throughout the year	Occasional visitor in house of New residential area, in Department of Zoology in University campus, in margin of fields in Padra, near *Mangifera indica* trees in Sayajibaug.	Feeds on Mangifera *indica*, *Punita granatum*. Moth sucks the juice from the half ripened fruits, on leaves of *Quisqualis indica*.
XVI.13.2	*O/E materna* Linn, 1767			
XVI.13.3	*O/O homaena* Hüb, 1823			
XVI.13.4	*Albama argillacea* Hübner, 1823	Throughout the year except late June to late August	On ground in *Gossypium sp.* field of Dabhoi,on *Gossypium sp.* plant in field of Waghodia.	Larvae feed on *Gossypium sp.* pods and leaves.
XVI.13.5	*Remigea/Mocis undata* Fab.1775	Late August to late March	On *Cajanus cajan* leaves in Padra fields, occasional visitor in house of New residential area.	Larvae feeds on Leguminocea plants
XVI.13.6	*R.archesis* Cramer,1779			
XVI.13.7	*Earias insulana* Boisduval,1833	Throughout the year	In dense vegetation near river stream in University campus. In botanical garden near *Hibiscus* plant.	Found on *Abutilon indicum, Hibiscus Sp.*
XVI.13.8	*Trigonodes hippasius* Cramer,1779	Late Aug to late March	On *Cajanus cajan* plant in Padra field ,also a accidental visitor at home in New residential area	Larvae feed on plants of family Leguminoseae

Sr. No.		Season	Habitat	Food-feeding
XVI.13.9	*Trichoplusia ni* Hubner 1803	Late Aug to late Jan	On *Helianthus annus* in Lalbaug garden,in *Brassica oleracea* fields in Padra, frequent visitor of house in New residential area.	Larvae eat the leaves of *Helianthus annus. Brassica oleracea*,
XVI.13.10	*Ophiusa coronata* Fab,1775	Throughout the year	In house at New residential area, in Sayajibaug on plant of *Quisqualis*.	Larva feds on *Quisqualis*
XVI.13.11	*Achaea janata* Linnaeus, 1758		In Ricinus communis plant in Savli field, on leaves of *Z.jujuba* in Laxmivilas palace.on rose in University botanical garden.	Feeds on *Ricinus communis*, Acasia *arabica, Z, jujube. Ficus bengalensis, Euphorbia hirta*, Rose, Pomegranate.
XVI.13.12	*Heliothes armigera* Hubner,1809		On *Gossypium sp*. leaf in Waghodia field. Larvae at home in flowers.	The larvae feeds on leaves and fruiting bodies of pulses, *Gossypium sp., Tegetes erecta, Chrysanthemum.*
XVI.13.13	*Spodoptera littoralis* Boisduval		On *Ricinus communis* leaf , near dense vegetation of stream in University campus .	The larvae bore into the fruits of Poppy, *Gossypium sp., Ricinus communis, and Brassica oleracea*. and spoil them
XVI.13.14	*Dysgonia stuposa* Fab,1794		In field margin of Savli and near house in New residential area and old city on Euphorbia plant.	Feeds on plants of Family Euphorbiacea
XVI.13.15	*Anomis flava* Fab,1775	Througout the year	In field of *Gossypium sp*. in Dabhoi.	Feeds on leaves of *Gossypium sp.*
XVI.14	**Syntomidae/ Amatidae**			
XVI.14.1	*Syntomis/ Amata* Cyssea Cramer,1782	Throughout the year	In field margins sitting on stem of *Moringa* ,occasional visitor in New residential area	Feeds on flowers of *Lantana aculeate*
XVI.14.2	*S.passalis* Fab		Found on stem of *Santalum album* in botanical garden in University campus.	Feeds on *Santalum album.*

Sr. No.		Season	Habitat	Food-feeding
XVI.15	**Arctidae**			
XVI.15.1	*Utetheisa pulchella* Linnaeus, 1758	Mid of June to late Dec.	Found in Laxmivilas palace near vegetation of *Crotolaria*, in University campus on leaves of *Heliotropium*.	larvae feeds on leaves of *Crotalaria juncea* , *Heliotropium indicum* and defoliates the plants
XVI.15.2	*Argina cribraria* Linnaeus 1758		In Laxmivilas palace on vegetation of *Crotalaria*.	,larvae Feeds on *Crotalaria sericea* boring into flower buds and seed pods,
XVI.15.3	*Pericallia ricini* Fabricius 1775	Throughout the year	In *Ricinus communis* vegetation in Savli and in University campus,	Larva defoliates *Cassia tora, Lantana, Ricinus communis, Zea mays., Solanum melongena, Moringa, Calotropis Nerium odorum, Helianthus annus*
XVI.15.4	*Creatonotus gangis* Linnaeus, 1763	Mid of August to late March	Near *Saccharum officinarum* fields of Waghodia	Larvae feeds on leaves of Paddy, *Saccharum officinarum*
XVI.15.5	*Estigmene lactinea* Cramer	Throughout the year except late June to late Aug	On leaves of *Gossypium sp.* in Dabhoi.	Feeds on leaves of *Gossypium sp.*
XVI.15.6	*Rhodogastrea astreas* Drury	Late Sep to late Jan	Occasional visitor of house.	Not known
XVI.16	**Pterophoridae**			
XVI.16.1	Unidentified Sp.	Throughout the year	On flowers of herbaceous plants during day time	Larvae are leaf rollers or stem borers of various herbaceous plants Adults feed on nectar/pollen of various herbaceous plants

Table 20 Hymenoptera

Sr. No.		Season	Habitat	Food-feeding
XVII.1	**Evanidae**			
XVII.1.1	*Evania appendigaster*	Oct-Dec	In houses of New residential area and fields of Padra	Parasitic on ootheca of *Periplaneta americana*
XVII.2	**I chneumonidae**			
XVII.2.1	*Xanthopimpla stemmator* Thunberg	Late Oct to late March	Frequent visitor of New residential area, flying in Paddy field of Padra, *Zea maize* field in Dabhoi, *Triticum aestivum* field in Waghodia.	Parasitoid on *Chilo partellus*
XVII.2.2	*Henicospilus merdarius*		On Umbelliferous flowers in gardens	Parasitoid of *Euproctis fraternal*
XVII.3	**Chalcididae**			
XVII.3.1	*Brachymeria hearseyi*	June to late Dec.	On Nerium flower in gardens	Parasite on pupae of Lepidoptera., Diptera , Coleoptera
XVII.4	**Chrysididae**			
XVII.4.1	*Stilbum cyanurum* Foerster, 1771	Throughout the year	In gardens and farmland ,near nest of solitary bees and wasps	Parasite of full grown adult or larvae of Eumenidae and Megachilidae
XVII.5	**Scoliidae**			
XVII.5.1	*Scolia quadripustulata* Fab	Throughout the year	Flying near *Ficus benghalensis* near cricket ground in University campus	Larvae ectoparasites on grubs of Scarabidae. Adult nectar feeder
XVII.5.2	*S.aureipennis*			
XVII.6	**Pompilidae**			
XVII.6.1	*Pompilus unifasciatus* Say		Almost in all sites.	Provision their nest with spiders
XVII.7	**Eumenidae**			
XVII.7.1	*Eumenes conica* Fabricius	Mid of June	Resting on the leaf of nymphea in botanical garden	Both, larvae and adults of *E.conica,*

Sr. No.		Season	Habitat	Food-feeding
		to late Dec	pond. In residential areas.	*E.esuriens, E.dimidiatipenis, E.pitiolatus, O.ovalis* are predators of Noctuid caterpillars and Chrysomelid beetle grubs
XVII.7.2	*E. esuriens* fabricius		Underside of *Cymbopogon martini* in Sayajibaug	
XVII.7.3	*E.dimidiatipenis*		Making mud nest on pipe in department	
XVII.7.4	*E.petiolatus*		Near cricket ground in University campus	
	Remark	*Solitary wasps,Predators*		
XVII.8	**Vespidae**			
XVII.8.1	*Odynerus ovalis* Fab,1804		From *Calotropis* in fields and fragmented habitats.	
XVII.8.2	*Icaria ferruginea* Fabricius		Making nest on middle vein of the leaf ,in Lalbaug	Larvae and adults of *I.ferruginea, P.fuscatus, P.erythrocephala,R.abdominate, R.cubzeipenne* are predators of Noctuid caterpillars and Chrysomelid beetle grubs
XVII.8.3.	*Polistes fuscatus* Fabricius1793.	Mid of June to late Dec	Flying in residential areas, also in fragmented habitat.	
XVII.8.4	*Parapssamophila erythrocephala* Menke		In vegetable field of Padra and Dabhoi	
XVII.8.5	*Rhynehium abdominate*	Throughout the year	Flying in Dabhoi fields on margin near *Moringa*	
XVII.8.6	*R. cubzeipenne*		In Savli field on margin on *Glycine* tree.	
XVII.8.7	*Vespa cincta* Fabricius, 1775		Flying in gardens in University campus and in Waghodia fields	Predator on *Apis cerana*. Larva is fed upon by other insects, decayed or fresh meat and fish.
	Remark	*Social wasp, Predators*		
XVII.9	**Sphecidae**			
XVII.9.1	*Sphex lobatus* Fab,1775		Flying in gardens and Laxmivilas palace ground.	Predator of Caterpillars, Hemiptera, Arachnida, Orthoptera
XVII.9.2	*S. pruinosus* Germar,1870		Flying in gardens	
XVII.9.3	*S. splendidum* Fab			

Sr. No.		Season	Habitat	Food-feeding
XVII.9.4	*Ammophila Sp.*	Throughout the year	Flying in margins of fields,also in residential areas	
XVII.9.5	*A. laevigata* Smith, 1856		In Sayajibaug garden, in residential areas	
XVII.9.6	*A.basalis* Smith, 1856		In field margin Padra and in residential areas.	
XVII.9.7	*Sceliphron madraspatanum pictum*		Under eaves of buildings in residential areas.	Predator of spiders
XVII.9.8	*Cerceris lunata* Costa, 1869		On leaves of family cucurbitacae in Padra, on stem of *Dalbergia latifolia* in Laxmivilas palace ,leaves of *Michelia champaca* in botanical garden.	Preys on beetles of family Curculionidae, Chrysomelidae and Buprestidae
XVII.9.9	*Bembix trepanda* Dahlbom		In residential areas, in University campus.	Preys on tabanids
	Remark	*Solitary wasp,Predators*		
XVII.10	**Xylocopidae**			
XVII.10.1	*Xylocopa aestuans* Linn	Throughout the year	Flying in all the sites of study area.	Both,larva and adults of *X.aestuans, X.fenestrata, X.auripennis, X.violacea, C,binghami, C.viridissima, C.heiroglyphica* are nectar feeders
XVII.10.2	*X.fenestrata* Fabr			
XVII.10.3	*X .auripennis* Lepel			
XVII.10.4	*X.violacea* Linn,1758			
XVII.10.5	*Ceratina binghami* Cockrell		On flowers of *Gaillardia sp*,Rosa sp.in gardens	
XVII.10.6	*C. viridissima* Dalla Torre		On *Calotropis* in University campus ,in	
XVII.10.7	*C.hieroglyphica* Smith		On *Gaillardia pinnatifida* in gardens	
	Remark	*Social bees ,pollinators*		
XVII.11	**Andrenidae**			
XVII.11.1	*Tetralonia duvaucelii* Lepel	Late Oct to late Feb	On flower of *Papaver paniculata, Lantana camara* in gardens	Larva and adult,of *Tetralonia duvaucelii* ,*Stegonomus nodicornis* nectar feeders

Sr. No.		Season	Habitat	Food-feeding
XVII.11.2	*Stegonomus nodicornis* Morawitz,1876	Throughout the year	Flying on bushes of *Ricinus communis* fields in Savli. On *Ixora* flowers in Lalbaug.	
XVII.12	**Halictidae**			
XVII.12.1	*Nomia westwoodii*	Throughout the year	On *Gaillardia aristata* in gardens coexisting with *Coccinella septumpunctata* on the same flower.	Parasitic
	Remark	*Social bees,pollinator*		
XVII.13	**Megachilidae**			
XVII.13.1	*Megachile ramkrushna*	In late Oct to late Feb	On flowers in gardens and in fields	Nectar and pollen feeder
XVII.13.2	M.lanata Fab 1775			
XVII.13.3	*Coelioxys apicata* Smith			Parasitic on Megachile and Anthophora
XVII.14	**Anthophoridae**			
XVII.14.1	*Anthophora fallax* Smith	Aug to March	Taking nectar from Gladiolus flower in Sayajibaug.	Larva and adult of *Anthophora fallax, Crocisa minuta, Apis indica, A. dorsata , A.florea* are nectar feeder
	Remark		*Parasitic*	
XVII.14.2	*Crocisa minuta* Rad	Aug to March	On pollinia of *Calotropis procera* flower in hedges of fields as well as in gardens.	
	Remark		*Pollinator,*	
XVII.15	**Apidae**			
XVII.15.1	*Apis indica*	Throughout the year	On various flowers in all gardens, residential areas, fragmented habitats, coexisting with each other and with ladybird, like *Coccinella septumpunctata.* Rarely found near agriculture fields.	
XVII.15.2	*A. dorsata* Fab,1793			
XVII.15.3	*A.florea* Fab,1787			
	Remark	*Social bees, pollinator*		

Overall Percentage composition in all the study sites

Percentage composition of the families of Orders whose population was significantly spotted, was calculated.

Percentage composition in families of Odonata (Chart 1)

Within Odonata four families were recorded .Percentage composition of Libellulidae represented was maximum followed by Coenagridae and Aeshnidae and that of Gomphidae was minimum.

Percentage composition in families of Orthoptera (Chart 2)

Out of the four families of Orthoptera collected in this study, maximum representation was of Acridids (60%). Families Tettigonidae and Gryllidae were 17% much less as compared to the family Acrididae. Gryllotalpidae was minimally represented (6%)

Percentage composition in families of Hemiptera (Chart 3)

During a duration of three years within hemipterans percentage composition of Pentatomidae (17%) was maximum, followed by Coreidae (15%), Reduviidae (10%), Aphididae (8%) and Lygaeidae (7%). The % composition of the rest of the families was either 5 or less then 5.

Percentage composition in families of Coleoptera (Chart 4)

Amongst the 25 families of Coleoptera found in Vadodara ,percentage composition of Carabidae was observed to be maximum (13%), followed by Scarabidae and Cerambycidae with 11%, Coccinellidae with 10%, Tenebrionidae(9%), Chrysomelidae(7%), Cassididae(6%), Curculionidae(5%) and other remaining families percentage were less .

Percentage composition in families of Diptera (Chart 5)

In Diptera, Muscidae was represented by maximum number of species(18%), Stratiomyidae,Culicidae and Tabanidae showed 12%,Asilidae with 9% and Syrphidae, Dolichopodidae with 6%, percentage composition of remaining other families were less.

Percentage composition in families of Lepidoptera (Graph 6)

From Lepidoptera, Noctuidae was the family which showed maximum percentage of species (18%), Nymphalidae with 16%, Pieridae and Lycaenidae with 15%, Sphingidae with 9% and Papilionidae with 6%. Other families were less than 5%.

Percentage composition in families of Hymenoptera (Graph 7)

In Hymenoptera, percentage composition of Sphecidae was maximum (21%), followed by Vespidae and Xylocopidae (16%), Megachilidae, Apidae, Euminidae (7%), other families were less.

Alpha diversity index (Table 22) for major orders

Alpha diversity index for Hemiptera

Fragmented habitat represented the maximum species richness (57 species) but the value of Shannon Weiner index was less (3.85) as compared to that of Community gardens (3.86), Evenness index value is also less (0.94) as compared to gardens (0.95). Berger Parker dominance index for community gardens is minimum (0.03) showing that all the species in community gardens were evenly distributed with no particular dominant species. Graph of Renyi diversity ordering (Graph 8) also confirms that community gardens have more species diversity.

Alpha diversity index for Coleoptera

Fragmented habitat represented maximum species diversity (88 species out of 92) with highest H value (4.14) .Individuals in this habitat are distributed more equitably (0.91) thus Berger Parker dominance index has least value of 0.043. Residential area can sustain 53 species only thus having least H value (3.71). Evenness index was also less (0.809) thus more B-P index value (0.054). Reyni diversity ordering also shows that residential areas are least diverse and fragmented habitats were maximally diverse (Graph 9)

Alpha diversity index for Diptera

This is one of the orders, whose species are equally distributed in all the study sites but as the population of species differs, evenness also varies amongst the

sites. Hence the Shannon Weiner index for species richness is also different. As shown in table H value for fragmented habitat is maximum (3.41) and Equitability index (0.96) is also maximum. Minimum H value is for residential areas (3.20) with minimum evenness (0.90) and maximum dominance (0.10). Reyni diversity ordering graph (Graph 10) shows that fragmented landscape and community gardens share almost equal species diversity and residential area shows least species diversity.

Alpha diversity index for Lepidoptera

Maximum species diversity of Lepidopterans is found in fragmented habitats (88).The Shannon Weiner diversity index value for fragmented habitat is maximum (2.79), with maximum Equatibility index of (0.95). Butterflies and moths are high fliers so even in residential areas with small gardens most of the species have been recorded (87). Reyni's Graph also shows that all sites were equally diverse (Graph 11)

Alpha diversity index for Hymenoptera

This is second order, whose number of species (45) is almost equally distributed in all the study areas. Shannon Weiner index H is maximum (3.64) for fragmented habitat, where species are distributed equally with equitability value as 0.95. Residential area shows minimum species diversity index (3.54). Reyni diversity ordering graph shows that residential areas were little less comparable to other three sites (Graph 12)

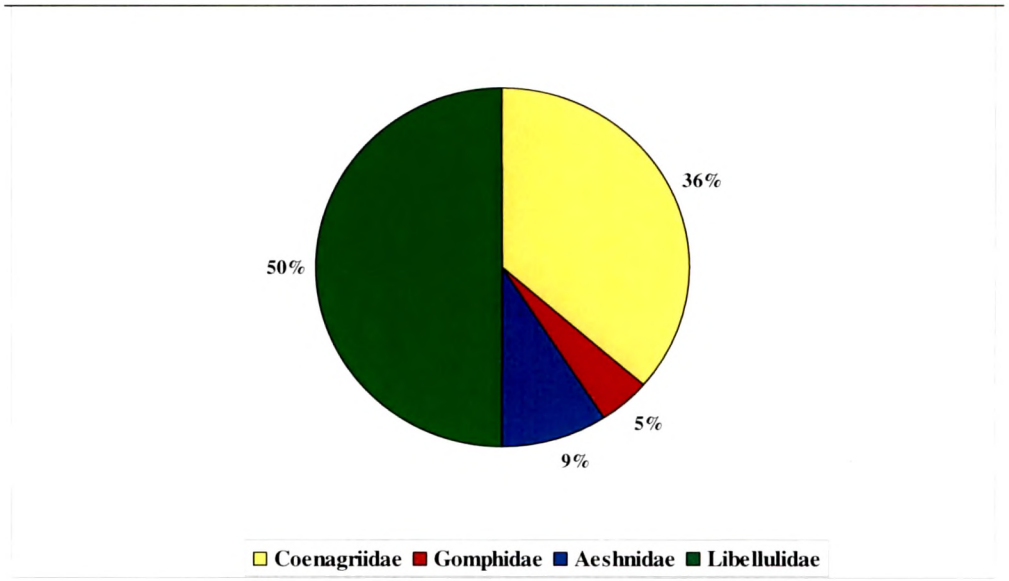
Beta diversity index (Table 23) for major orders in all sites

The values of Whittaker's and Wilson-Shmida index for Beta diversity ranges from 0-1. Value 0 represents similarity of species diversity between the sites. As the value goes near 1, difference of species increases and if the value is 1, all the species of both the sites are different. In the present study as shown in the table all the Orders are having values much less then one. This supports the fact that almost all the species were found in all the four habitats, although the number spotted varied considerably.

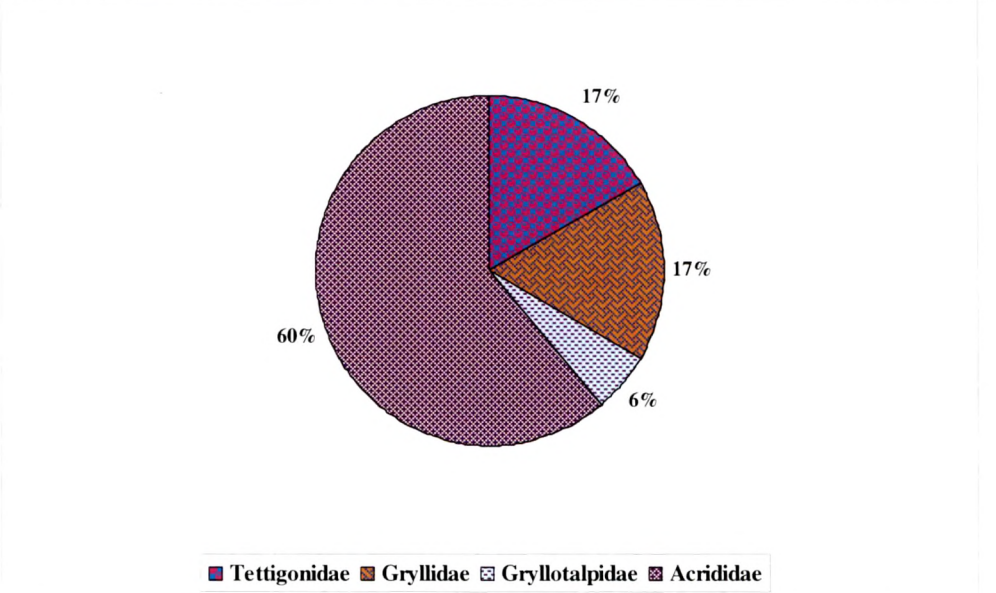
Table 21 Species composition of insects in Vadodara

Order	Family no	Genus no.	Species no.
Thysanura	1	2	2
Diplura	1	1	1
Collembola	1	1	1
Ephemeroptera	1	1	1
Odonata	4	19	22
Orthoptera	4	15	17
Phasmida	1	1	1
Dermaptera	2	2	2
Embioptera	1	1	1
Dictyoptera	3	8	8
Hemiptera	22	52	59
Thysanoptera	1	4	4
Neuroptera	3	5	5
Coleoptera	25	77	93
Diptera	17	30	32
Lepidoptera	16	67	88
Hymenoptera	15	31	45
Total	118	315	382

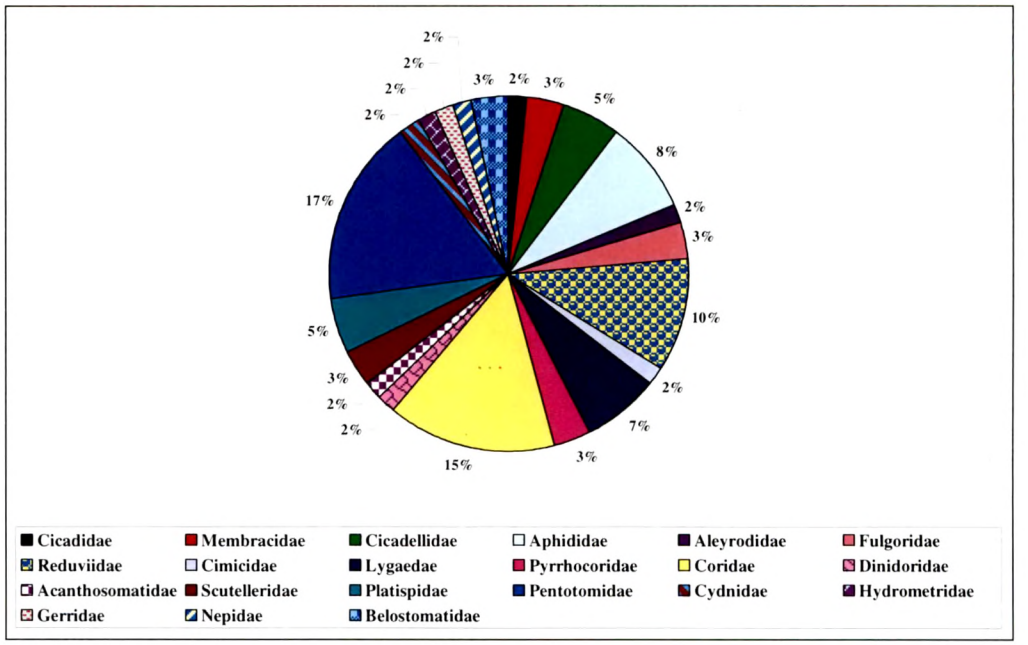
Graph 1 Percentage composition of families of Odonata in Vadodara



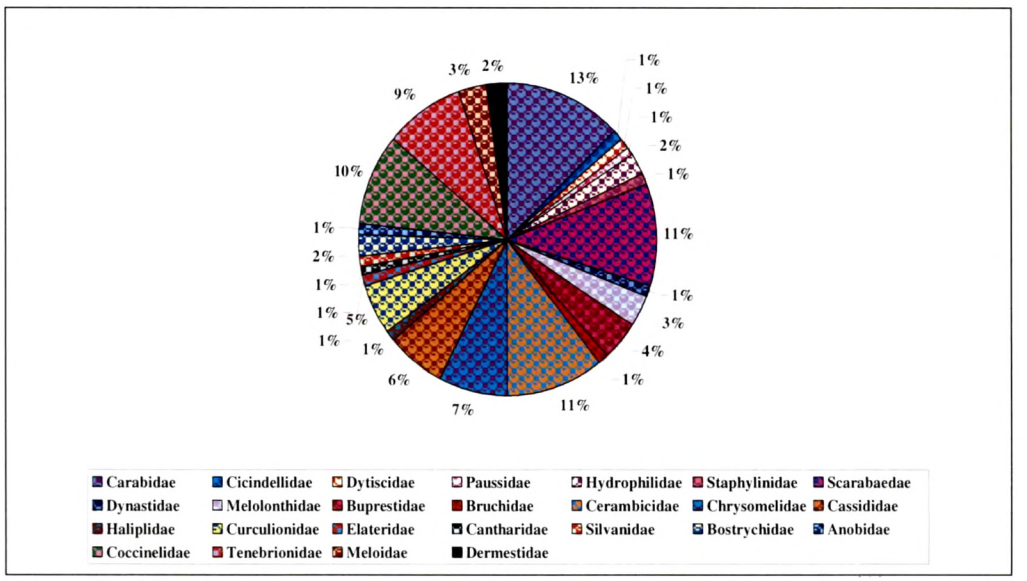
Graph 2 Percentage composition of families of Orthoptera in Vadodara



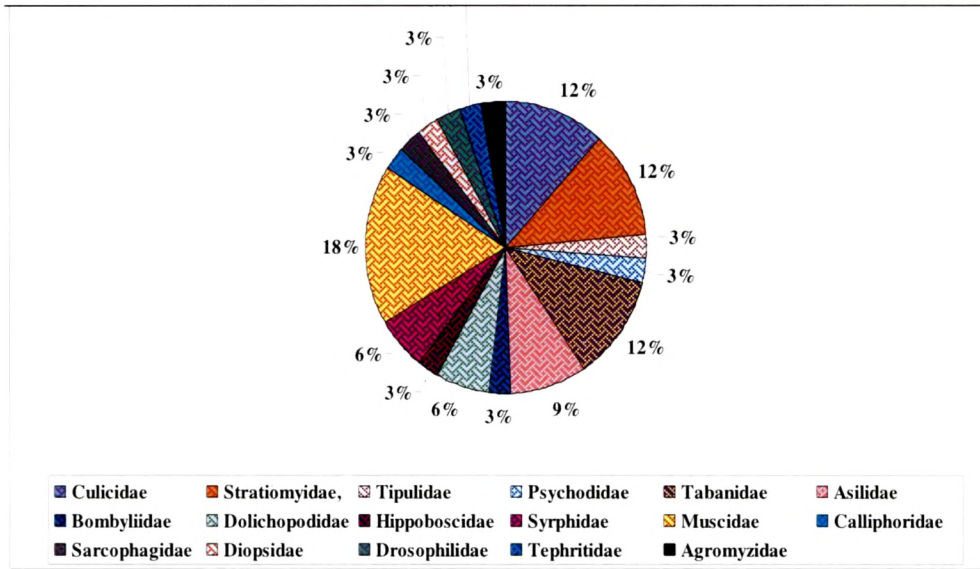
Graph 3 Percentage composition of families of Hemiptera in Vadodara



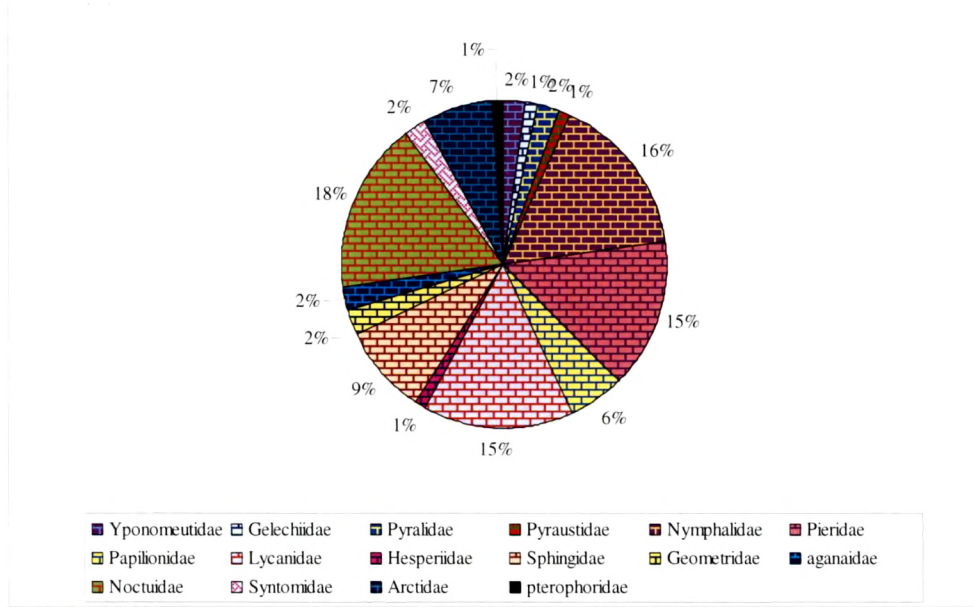
Graph 4 Percentage composition of families of Coleoptera in Vadodara



Graph 5 Percentage composition of families of Diptera in Vadodara



Graph 6 Percentage composition of families of Lepidoptera in Vadodara



Graph 7 Percentage composition of families of Hymenoptera in Vadodara

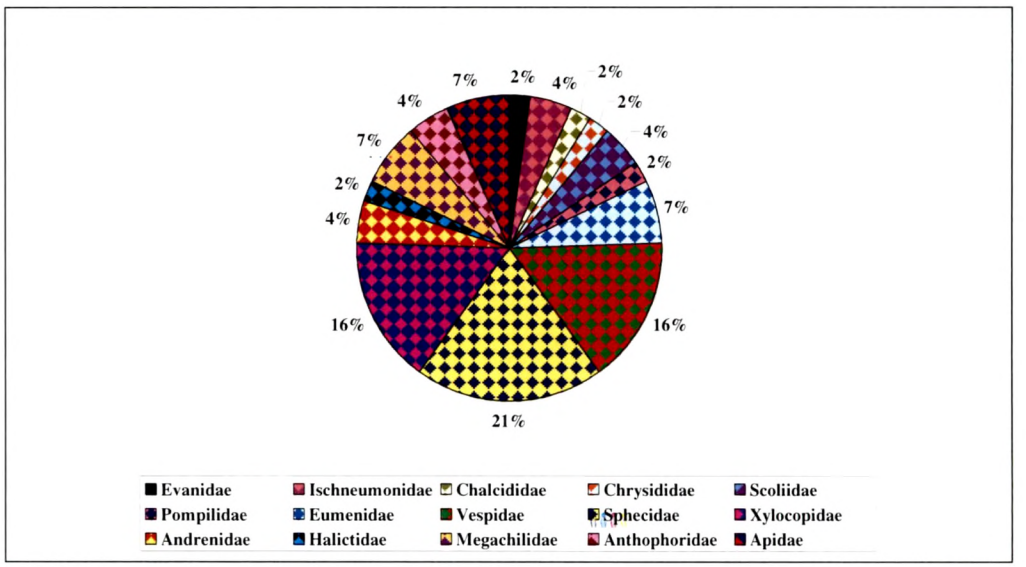


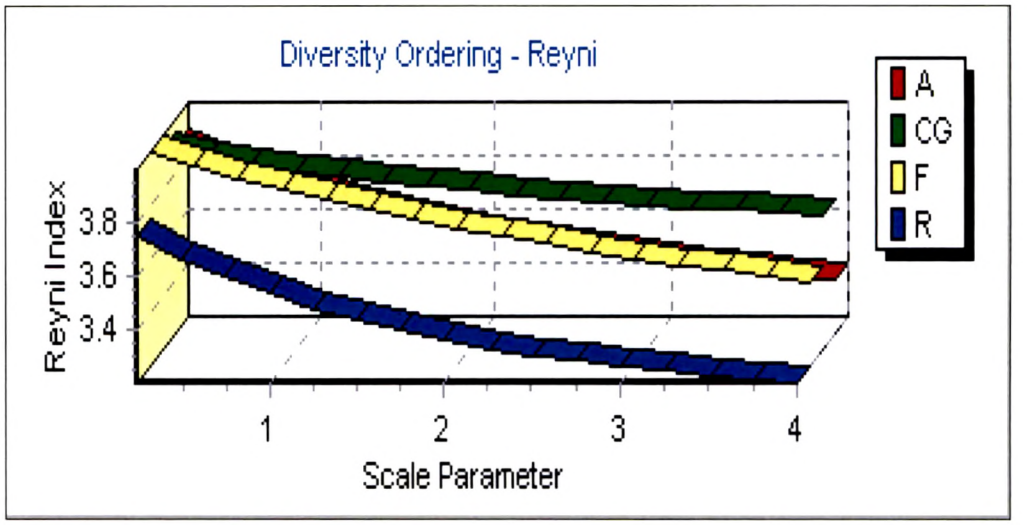
Table 22 Alpha diversity index for all the study sites

Diversity measure	Agriculture fields	Community gardens	Fragmented habitats	Residential sites
Hemiptera				
H	3.729	3.861	3.853	3.532
J	0.918	0.950	0.949	0.869
Berger-parker	0.052	0.034	0.046	0.061
Species no.	52	53	57	46
Coleoptera				
H	4.081	4.018	4.149	3.712
J	0.900	0.886	0.915	0.819
Berger Parker	0.054	0.049	0.043	0.054
Species no.	84	77	88	53
Diptera				
H	3.317	3.399	3.418	3.202
J	0.940	0.964	0.969	0.908
Berger Parker	0.070	0.055	0.061	0.108
Species no.	34	34	34	34
Lepidoptera				
H	4.233	4.238	4.279	4.256
J	0.945	0.946	0.955	0.950
Berger Parker	0.055	0.028	0.024	0.031
Species no.	85	88	88	87
Hymenoptera				
H	3.566	3.553	3.640	3.544
J	0.936	0.933	0.956	0.931
Berger Parker	0.084	0.116	0.101	0.087
Species no.	45	44	45	45

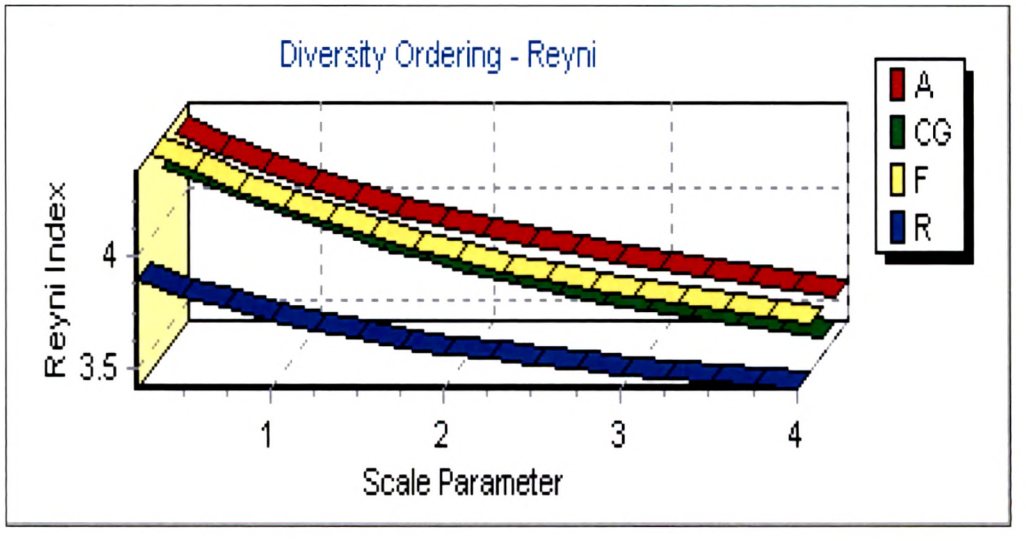
Table 23 Beta diversity index within the sites

Sites	Whittaker's and Wilson-Shmida index				
	Hemiptera	Coleoptera	Diptera	Lepidoptera	Hymenoptera
A-CG	0.083	0.105	0	0.017	0.01123
A-F	0.045	0.069	0	0.017	0
A-R	0.081	0.255	0	0.023	0
CG-F	0.036	0.052	0	0	0.01123
CG-R	0.090	0.230	0	0.005	0.01123
F-R	0.127	0.262	0	0.005	0

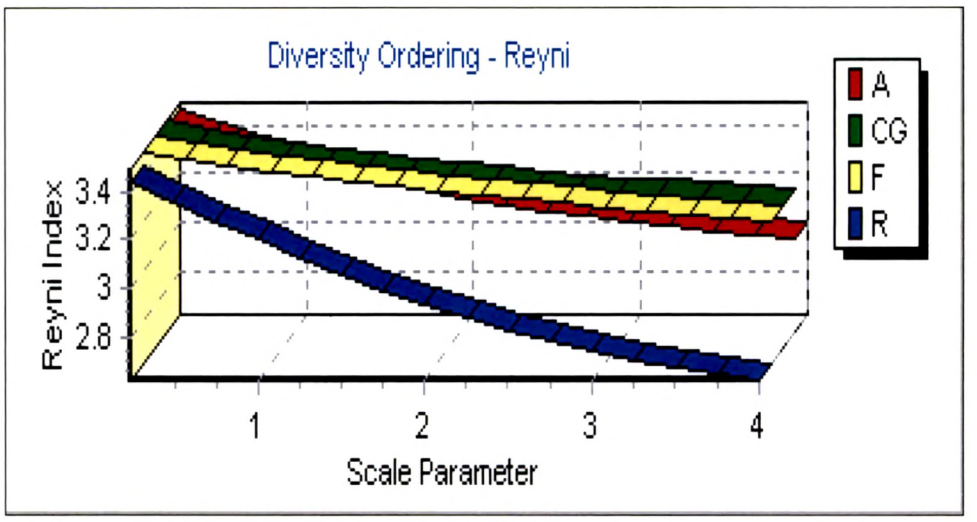
Graph 8 Reyni diversity ordering for the order Hemiptera



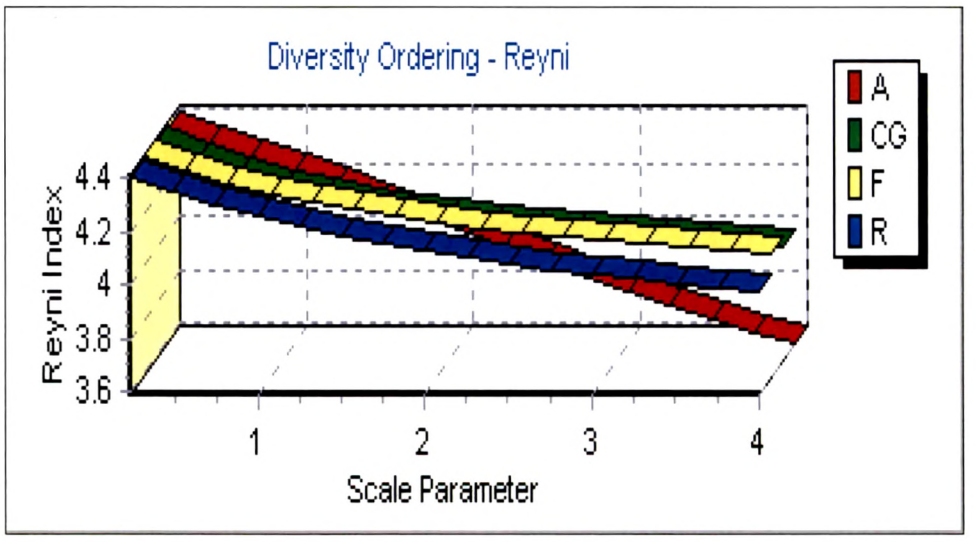
Graph 9 Reyni diversity ordering for the order Coleoptera



Graph 10 Reyni diversity ordering for the order Diptera



Graph 11 Reyni diversity ordering for the order Lepidoptera



Graph 12 Reyni diversity ordering for the order Hymenoptera

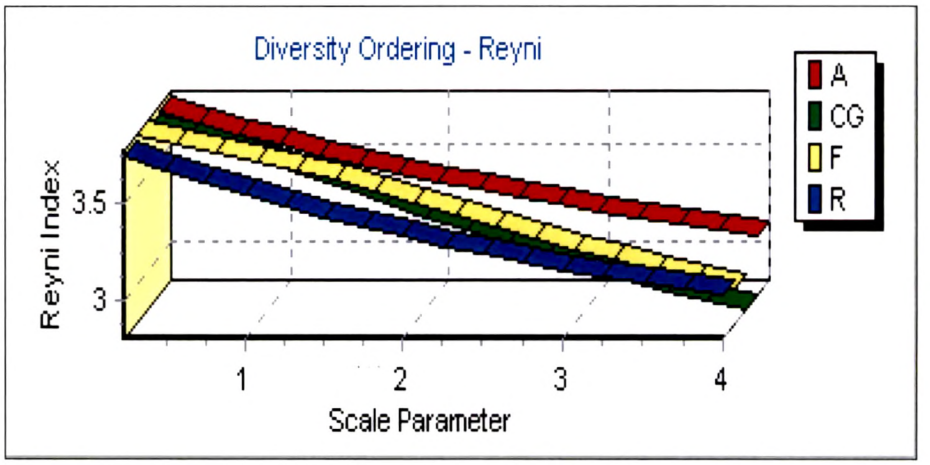


Figure 17
Ephemera vulgata
Perching on a
grass stem

Figure 18
Euconocephalus sp.
On *Gaillardia*
flower

Figure 19
Tryxalis turrita
On rose

Figure 20
Liogryllus bimaculatus
Within the vegetable field

Figure 21
Gryllotalpa fossor
From the Paddy fields

Figure 22
Labia minor
Found crawling in grass.

Figure 23
Diplocodes trivialis
Perching around the grounds of agricultural field .

Figure 24
Cereagrion coromandelianum
On the leaf of *Solanum melongina*

Figure 25
Group of *Anaciaeschna jaspidea*
Perching on twigs of *Acacia* in Laxmivilas palace ground

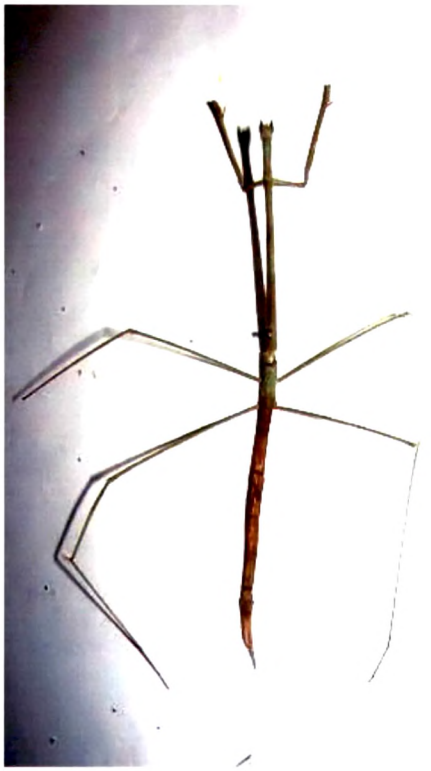


Figure 26
Megaphasma sp.
Rare in Vadodara, collected from Sayajibaug.

Figure 27
Gongylus gongiloides
On the trunk of *Casuarina equisatifolia*, *Mangifera indica*

Figure 28
Platypleura octoguttata
Collected from hedges around agricultural fields.

Figure 29
Nephotettix nigropictus
Normally on leaves of rice crop.

Figure 30
Oxyrachis tarandus
(mating pair)
On stem of
Calotropis sp.

Figure 31
colony of *Aphis nerii*
On leaf of *Calotropis*
on the road side of
new residential area.

Figure 32
Pyrilla perpusilla
On a grass blade

Figure 33
Harpactor costalis
On Cotton crop within agricultural fields

Figure 34
Antilochus coqueberti
On cotton plant in Savli

Figure 35
Lygaeus militaris
On flower of *Calotropis procera*

Figure 36
Petillia lobipes
In dense vegetation around Vishwamitri river flowing from the University Campus

Figure 37
Halys dentatus
On tree trunk

Figure 38
Aspongopus janus
Collected from surroundings of castor fields

Figure 39
Chrysocoris stolli
Collected from garden of new residential area.

Figure 40
Coptosoma testaceum
Collected from leaves of *lablab.*

Figure 41
Belostoma indicum
Rare spotted in the Pond
of lalbaug.

Figure 42
Laccotrephes maculatus
Almost in all the ponds

Figure 43
Brachynemurus abdominalis
Around the field margin of wheat crop.

Figure 44
Helicomitus species
Along vegetable field margin

Figure 45
Calosoma orientalis
Collected from
Laxmivilas Palace
compound.

Figure 46
Paussus nauceras
Under stones within
residential areas.

Figure 47
Haliplus
augustifrons
In the ponds

Figure 48
Henosepilachna vigintioctopunctata
On cucurbitaceous leaf in university campus

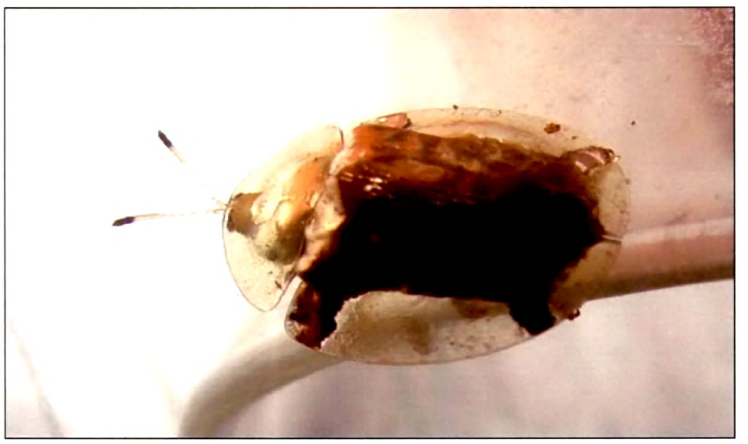


Figure 49
Aspidomorpha diformis
Anywhere within vegetable fields

Figure 50
Psiloptera cupriosplendense
From the dense vegetation of laxmivilas palace

Figure 51
Hydrous indicus
Found in lalbaug
pond

Figure 52
Oryctes
rhinocerous
Under Toddypalm
in laxmivilas
palace

Figure 53
Catharsius molossus
From the gardens

Figure 54
Oxytonia versicolor
Spotted in University campus.

Figure 55
Chrysolampra indica
Sighted in the gardens

Figure 56 *Psaldolytta menoni*
Around the paddy field

Figure 57 *Cybister punctatus*
Spotted
Around and within Vishwamitri stream in University Campus.

Figure 58 *Holotrichia insularis*
Pest of sugarcane from sugarcae field

Figure 59 *Sybaris testaceus*
From the private garden of residential areas.

Figure 60 *Pseudoblaps mellyi*
Periphery of the agricultural fields

Figure 61
Plocaederus ferrugineus
Sal tree borer, from the University campus.

Figure62
Agrypnus fuscipes
Hedges of fields

Figure 63
Synoxylon anale
Borer of small and large trees.

Figure 64
Paederus fuscipes
Collected from damp soil of fields before sowing.

Figure 65
Cyrlozernia dispar
Collected from
dense vegetation.

Figure 66
Anopheles sp.
Omnipresent.

Figure 67
Sargus metallinus
Collected from dense vegetation

Figure 68
Allocotasia aurata
Margins of fields on hedges.

Figure 69
Conosia irrorata
From plants and tree trunks

Figure 70
Agyramoeba distigmata
Flying around flowers and dense vegetation of Sayajibaug

Figure 71
Hippobosca variegata
Ectoparasite on cattle
around fields

Figure72
Tabanus striatus
From the garden of University campus.

Figure73
Condylostylus species
Normally on the leaves and ground.

Figure74
Sphaerophoria scutellaris
Hovering around flowers in gardens and fields.

Figure75
Pycnosoma flaviscep
On *Calotropis* flower in University campus.

Figure76
Lucilia illustris
On leaf of brinjal.

Figure77
Stomoxys calsitrans
On cucurbitaceous leaf in Laxmivilas palace.

Figure 78
Sphercephala herceyana
In the dense vegetation around Vishwamitri in University campus.

Figure 79
Dacus dorsalis
On the stem of Calotropis.

Figure 80
Theretra nessus
On vegetation in the field margin

Figure81
Trichoplusia ni
On castor leaf

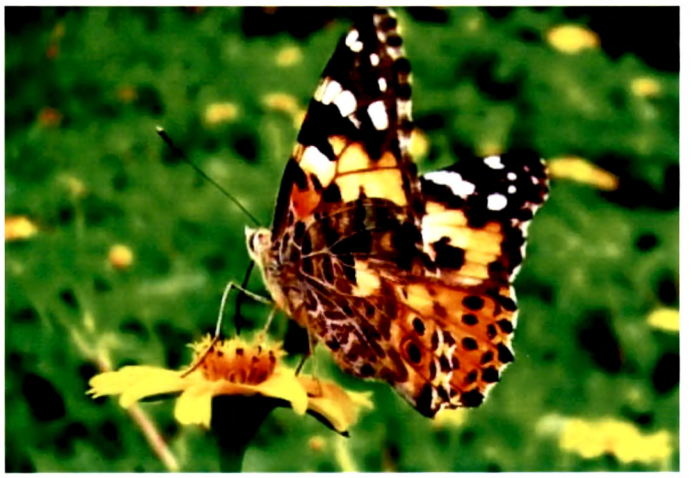


Figure 82
Vanessa cardui
From the gardens.

Figure 83
Papilio demoleus
(underwings)
From dense
vegetation.

Figure 84
Rhodogastrea astreas
Generally in crop fields,occasionally visits houses.

Figure 85
Asota iodamia
On tender leaves of banyan tree.

Figure 86
Syntomis passalis
Amongst the vegetation around the margins

Figure 87
Colotis danae
On grass in gardens

Figure 88
Nausinoe geometralis
On leaves in dense vegetation.

Figure 89
Scirpophaga auriflua
Collected from
sugarcane stem.

Figure 90
Atteva niveigutta
In dense vegetation

Figure 91
Pelopidas mathias
Found in gardens

Figure 92
Tarucus extricatus
on flower of
Calotropis procera

Figure 93
Zizina karsandra
On flower of *Lantana camara*

Figure 94
Family:
Pterophoridae
On *Calotropis* flowers
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Figure 95
Stilbum cyanurum
Around and within cricket ground in the University campus.

Figure 96
Xanthopimpla stemmator
Around sugarcane fields

Figure 97
Stegonomus nodicornis
On flowers in gardens

Figure 98
Scolia quadripustulata
Near cricket ground in
laxmivilas palace.

Figure 99
Pompilus unifasciatus
Near and around banyan
tree in search of spiders.

Figure 100
Sphex lobatus
Collected from gardens
and dense vegetation

Figure 101
Eumenes esuriens
*F*eeding on
lepidopteran pupa

Figure 102
Icaria ferruginia
Making paper nest on
central vein of a leaf.
some cells are
already made

Figure 103
Brachymeria
hearseyi
On flower of *Nerium*

Figure 104
Odynerus ovalis
On flower of
Calotropis procera

Figure 105
Ceratina binghamii
On *Gaillardia* flower
in botanical garden

Figure 106
Megachile lanata
On leaf of
malvaceous plant

Figure 107
Anthophora fallax
Sucking nectar from
gladiolus flower in
Sayajibaug garden

Figure 108
Nomia westwoodii
with *Chilomenes*
sexmaculata
On flower of
Gaillardia in Lalbaug

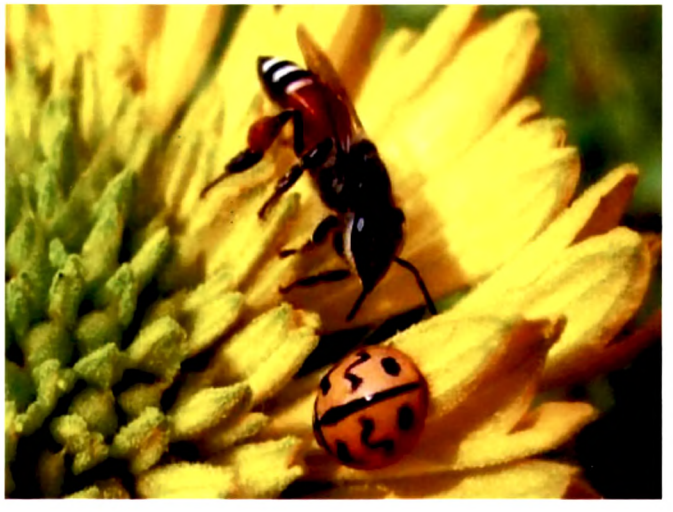

Figure 109
Apis dorsata with
C.sexmaculata On
Gaillardia
In botanical garden