Program & Abstract book

Editors: Omid Joharchi & Alireza Saboori

Program & Abstract book of the Second International Persian Congress of Acarology

Editors:

Omid Joharchi & Alireza Saboori

29–31 AUGUST 2013, Karaj, IRAN

President

Dr. Bahman Parsi

Scientific Secretary

Dr. Alireza Saboori
University of Tehran, Karaj, Iran

Executive Secretary

Dr. Omid Joharchi
Yazd Branch, Islamic Azad University, Yazd, Iran

Organizers

Acarological Society of Iran
University of Tehran – Department of Plant Protection, Faculty of Agriculture
University of Montenegro - Department of Biology, Faculty of Science
Center for Biodiversity of Montenegro

Sponsors

Acarological Society of Iran
University of Tehran
Ministry of Science, Research and Technology

SCIENTIFIC COMMITTEE

Chair:

Alireza Saboori – University of Tehran, Karaj, Iran

Members:

Mohammad Ali Akrami, Iran
Ibrahim Çakmak, Turkey
Yaghub Fathipour, Iran
Tetsuo Gotoh, Japan
Karim Haddad, Iran
Jalil Hajizadeh, Iran
Mohammad Khanjani, Iran
Mehdi Khosrowshahi, Iran
Serge Kreiter, France
Sara Magalhaes, Potugal
Joanna Mąkol, Poland
James A. McMurtry, USA
Maria Navajas, France
Bahman Parsi, Iran
Vladimir Pešić, Montenegro
Peter Schausberger, Austria
Edward A. Ueckermann, South Africa

EXECUTIVE COMMITTEE

Chair:

Omid Joharchi –Yazd Branch, Islamic Azad University, Yazd, Iran

Members:

Ali Ahadiyat – Science and Research Branch, Islamic Azad University, Tehran, Iran
Esmaeil Babaeian – University of Tehran, Karaj, Iran
Mehdi Bohloolzadeh – University of Tehran, Karaj, Iran
Zahra Cheraghali – Acarological Society of Iran, Karaj, Iran
Somayeh Haghani – University of Tehran, Karaj, Iran
Maryam Keshvarz Jamshidian – University of Tehran, Karaj, Iran
Mona Moghadasi – University of Tehran, Karaj, Iran
Helen Mohammadi – University of Tehran, Karaj, Iran
Nastaran Razavi Susan – University of Tehran, Karaj, Iran
Mahdi Saei Dehghan – University of Tehran, Karaj, Iran
Mahdi Tork– University of Tehran, Karaj, Iran
Azadeh Zahedi Golpayegani – University of Tehran, Karaj, Iran

Referees

Mohammad Abdigoudarzi (Iran), Ali Ahadyiat (Iran), Mohammad Ali Akrami (Iran), Gerd Alberti (Germany), Hossein Allahyari (Iran), James W. Amrine (USA), Fariba Ardeshir (Iran), Mahdieh Asadi (Iran), Mohammad Bagheri (Iran), Ibrahim Cakmak (Turkey), Louise Coetzee (South Africa), Enrico de Lillo (Italy), Ivsel Denizhan (Turkey), Salih Doğan (Turkey), Sergey G. Ermilov (Russia), Norman Fashing (USA), Yaghoub Fathipour (Iran), Mohammad Ghadamyari (Iran), Tetsuo Gotoh (Japan), Karim Haddad Irani-nejad (Iran), Hamidreza Hajiqanbar (Iran), Jalil Hajizadeh (Iran), Maoud Hakimitabar (Iran), Bruce Halliday (Australia), Asadollah Hosseini Chegeni (Iran), Shahriar Jafari (Iran), Mehdi Jalaeian (Iran), Omid Joharchi (Iran), Hashem Kamali (Iran), Aurang Kavousi (Iran), Shahrooz Kazemi (Iran), Mohammad Khanjani (Iran), Alexander A. Khaustov (Ukrain), Serge Kreiter (France), Malihe Latifi (Iran), Sara Magalhaes (Portugal), Joanna Mąkol (Poland), James A. McMurtry (USA), Maria Navajas (France), Alireza Nemati (Iran), Hadi Ostovan (Iran), Hasan Rahmani (Iran), Maurice W. Sabelis (The Netherlands), Alireza Saboori (Iran), Ahad Sahragard (Iran), Peter Schausberger (Austria), Marjan Seiedy (Iran), Mohammad-Hasan Shamsi (Iran), Davood Shirdel (Iran), Reza Talaei-Hasanloui (Iran), Khalil Talebi (Iran), Edward A. Ueckermann (South Africa), Andreas Wohltmann (Germany), Azadeh Zahedi Golpayegani (Iran), Abbas Ali Zamani (Iran)

2nd IPCA program

Thursday, 29 August 2013

8:00-10:00
Registration

10:00-10:10
Bahman Parsi - Opening ceremony
Welcome and greetings

10:10-10:30
Alireza Saboori – History of Acarology in Iran

10:30-11
Coffee break

Invited speakers

11:00-11:30
Enrico de Lillo - A few morphological, biological and ethological aspects on Eriophyoid Mites favouring their success, with particular regard on the Biological Control of Invasive Plants

11:30-12:00
Maria Lordes Moraza - A comparative study of the chaetotaxy and structure of tarsus I in Mesostigmata mites (Acari: Parasitiformes): developing a system to notate the tarsal setae

12:00-14:30
Lunch

14:30-16:00
Poster session 1

Code	Title	Corresponding Author
	TAXONOMY & BIODIVERSITY	
P 01	INTRODUCTION OF SEVEN ASCID MITES (ACARI:ASCIDAE) SPECIES COLLECTED ON ERIOPHYOID MITES (ACARI: ERIOPHYOIDAE) INFESTED PLANTS IN GUILAN PROVINCE	ADELI SEYED MOHAMMAD
P 02	INTRODUCTION OF NINE PREDATORY PHYTOSEIIDE MITES (ACARI: PHYTOSOSEIIDAE) SPECIES ASSOCIATED WITH *ACERIA ERINEUS* (NALEPA) (ACARI: ERIOPHYIDAE) IN GUILAN PROVINCE	ADELI SEYED MOHAMMAD
P 03	FIRST RECORD OF *CHEIROSEIUS* (*POSTTREMATUS*) *UNGUICULATUS* (BERLESE) (MESOSTIGMATA: BLATTISOCIIDAE) FROM IRAN	ARJOMANDI ELHAM
P 04	NEW SPECIES AND RECORDS OF FAMILY CRYPTOGNATHIDAE (ACARI: PROSTIGMATA: RAPHIGNATHOIDEA) FROM IRAN	BAGHERI MOHAMMAD
P 05	FIRST RECORD OF THE MALE OF ECTOPARASITIC MITE *COCCIPOLIPUS MACFARLANEI* (ACARI:	BAHRAMIAN MORTEZA

	PODAPOLIPIDAE) ON *COCCINELLA SEPTEMPUNCTATA* (COL.: COCCINELLIDAE) FROM IRAN	
P 06	SPECIES COMPOSITION OF MITES OF THE FAMILY LAELAPIDAE (ACARI: MESOSTIGMATA) IN MAIN CLIMATE ZONES OF TEHRAN PROVINCE, IRAN	BAROOZEH SIMIN
P 07	FAUNA OF BDELLOID AND RAPHIGNATHOID MITES (ACARI: TROMBIDIFORMES) IN RODBAR- GHASRAN REGION (SHEMIRANAT), TEHRAN PROVINCE, IRAN.	CHERAGHALI ZAHRA
P08	MITE FAUNA ASSOCIATED WITH THE FIG TREES (*FICUS CARICA* L.) IN ESTAHBAN (FARS PROVINCE), IRAN	AKRAMI, MOHAMMAD ALI
P 09	FIRST RECORD OF THE GENUS AND SPECIES *EREYNETOIDES AMPLECTORUS* (ACARI: EREYNETIDAE) FROM IRAN	DARBEMAMIEH MARYAM
P 10	FAUNA OF MESOSTIGMATIC MITES (ACARI: MESOSTIGMATA) ASSOCIATED WITH THE MEDITERRANEAN PINE ENGRAVER BEETLE, *ORTHOTOMICUS EROSUS* (WOLLASTON) (COLEOPTERA: CURCULIONIDAE: SCOLYTINAE) IN MARKAZI PROVINCE, IRAN	FARMAHINY FARAHANI VAHID REZA
P 11	IDENTIFICATION OF LAELAPIDAE MITES (ACARI: MESOSTIGMATA) INHABITING IN SOIL-LITTER AND ASSOCIATED WITH ANT'S NESTS IN SOME REGIONS OF MASHHAD, IRAN	GHAFARIAN AZADEH
P 12	MITE FAUNA OF THE SUPERFAMILY ERIOPHYOIDEA (ACARI: PROSTIGMATA) ASSOCIATED WITH LANDSCAPING PLANTS AND TREES IN MASHHAD CITY	GHAREZADEH MARYAM
P 13	SPECIES COMPOSITION OF TETRANYCHOIDEA (ACARI: TROMBIDIFORMES: PROSTIGMATA) IN SEVEN PARKS OF TEHRAN, IRAN	GHASEMIMOGHA DAM SAHEBE
P 14	A NEW GENUS AND SPECIES RECORDS OF ORIBATID MITES FOR IRAN MITE FAUNA, FROM HEYRAN AND ARASBARAN REGIONS	GHEBLEALIVAN D SAEIDE SADAT
P 15	SMINTHURIDAE LUBBOCK, 1862 (INSECTA: COLLEMBOLA) AS NEW HOST FOR SUBFAMILY ERYTHRAEINAE (ACARI: ERYTHRAEIDAE)	HAKIMITABAR MASOUD
P 16	FAUNISTIC SURVEY OF MITES ASSOCIATED WITH ORNAMENTAL PLANTS IN TEHRAN, IRAN	HAMIDI PERSILA
P 17	THE EDAPHIC MITES OF THE PHYTOSEIIDAE FAMILY FROM ORCHARDS OF LORESTAN PROVINCE	HASANVAND IMAN
P 18	SOME OF EDAPHIC MESOSTIGMATIC AND PROSTIGMATIC MITES IN SOUTHWEST OF EAST AZERBAIJAN PROVINCE, IRAN	HASHEMI KHABIR ZAHRA
P 19	FAUNISTIC STUDY THE FAMILY OF LAELAPIDAE (ACARI: MESOSTIGMATA) IN LORESTAN PROVINCE, IRAN	HEYDARI HADI
P 20	FIRST RECORD OF THE *PREMICRODISPUS AKERMANAE* (SEVASTIANOV & AL DOURI, 1988) (ACARI: MICRODISPIDAE) FROM IRAN	HOSSEINI NAVEH FARAHNAZ
P 21	FIRST RECORD OF THE FAMILY LABIDOSTOMATIDAE (ACARI: PROSTIGMATA) FROM KHORASAN RAZAVI PROVINCE, IRAN	JALAEIAN MAHDI
P 22	NEW RECORDS OF THE SUPERFAMILY RHODACAROIDEA (ACARI: MESOSTIGMATA) FROM KHORASAN RAZAVI PROVINCE WITH REPORT OF ONE NEW GENUS FOR IRAN MITE FAUNA	JALAEIAN MAHDI
P 23	PRESENT STATUS OF GALL MITES (ACARI: PROSTIGMATA: ERIOPHYOIDEA) ON ALMOND TREES IN KHORASAN RAZAVI PROVINCE (NORTH EAST OF IRAN)	KAMALI HASHEM
P 24	MITES OF THE FAMILY LAELAPIDAE (ACARI: MESOSTIGMATA: DERMANYSSOIDEA) IN ALBORZ PROVINCE, IRAN	KESHAVARZ JAMSHIDIAN MARYAM
P 25	FIRST RECORD OF *PROTOGAMASELLUS BIFURCALIS* (MESOSTIGMATA: ASCIDAE) FROM IRAN	KHADEMI NARJES
P 26	*GONOCEPHALUM PUBIFERUM* REITTER, 1904 (COL.: TENEBRIONIDAE), A NEW HOST RECORD FOR *HETERODISPUS TURKMENISTANENSIS* KHAUSTOV AND CHYDYROV, 2005 (ACARI: HETEROSTIGMATINA: SCUTACARIDAE)	LOGHMANI AMIR
P 27	THREE NEW SPECIES OF FAMILY ERIOPHYIDAE (TROMBIDIFORMES: ERIOPHYOIDEA) FROM WALNUT TREES, *JUGLANS REGIA* L.	LOTFOLLAHI PARISA

	(JUGLANDACEAE) IN IRAN	
P 28	FIVE NEW RECORDS OF ERIOPHYID MITES (TROMBIDIFORMES: ERIOPHYIDAE) OF LANDSCAPING TREES IN IRAN	LOTFOLLAHI PARISA
P 29	FAUNISTIC STUDY OF THE RAPHIGNATIDAE AND CRYPTOGNATIDAE FAMILIES (ACARI: TROMBIDIFORMES) FROM LORESTAN PROVINCE	RAHMATI
P 30	REPORT OF TWO NEW GENERA FOR THE BRYOBIINI TRIBE (ACARI: TETRANYCHIDAE) FAUNA OF ASIA AND IRAN, WITH NEW HOST REPORTED FOR THEM GENERA	MAHDAVI SAYED MOSAYEB
P 31	REPORT OF ONE NEW GENUS AND THREE SUBGENERA FOR THE HYSTRICHONYCHIINI TRIBE (ACARI: TETRANYCHIDAE) FAUNA OF IRAN	MAHDAVI SAYED MOSAYEB
P 32	REPORT OF TWO NEW SPECIES FOR THE *TETRANYCHUS* GENUS(ACARI: TETRANYCHIDAE) FAUNA OF KERMAN AND ASIA WITH NEW HOST REPORTED	MAHDAVI SAYED MOSAYEB
P 33	INTRODUCTION OF SOME MESOSTIGMATIC AND ASTIGMATIC MITES ASSOCIATED WITH THE DATE PALMS IN LARESTAN, (FARS PROVINCE), SOUTHERN IRAN	MOHAMMAD ALI AKRAMI
P 34	FAUNA OF TERRESTRIAL PARASITENGONA (ACARI: TROMBIDIFORMES) ECTOPARASITIC ON ARTHROPODA IN MEHRIZ AND TAFT REGIONS, YAZD PROVINCE, IRAN	MOHAMADI SOMAYE
P 35	CRYPTOGNATHID MITES(ACARI: TROMBIDIFORMES: CRYPTOGNATHIDAE) OF NORTHWEST IRAN	MOHAMMAD BAGHERI
P 36	MITES OF THE FAMILY STIGMAEIDAE (ACARI: PROSTIGMATA) IN HAMEDAN PROVINCE, IRAN	MOHAMMADI LADAN
P 37	FIRST RECORD OF THE *BIUNGUIS* SPECIES GROUP (ACARI: PODAPOLIPIDAE: *EUTARSOPOLIPUS*) PARASITISING CARABID BEETLES FROM IRAN	MORTAZAVI ABDOLAZIM
P 38	GEOGRAPHIC DISTRIBUTION OF IXODID TICKS (ACARI: IXODIDAE) IN NORTHERN IRAN USING GIS	MOSLEM SARANI
P 39	CAMEROBIID MITES (ACARI: TROMBIDIFORMES) OF NORTHWEST IRAN, WITH DESCRIPTION OF NEW SPECIES AND REDESCRIPTION OF *NEOPHYLLOBIUS ASTRAGALUS* KHANJANI & UECKERMANN (2002)	MALEKI NASER
P 40	BDELLOID MITES FAUNA OF MARAND (NORTHWEST OF IRAN) WITH FOUR NEW SPECIES TO SCIENCE AND THE FIRST OCCURRENCE OF THE GENUS *RUBROSCIRUS* DEN HEYER FROM IRAN	NAVAEI-BONAB REZA
P 41	MITES OF THE FAMILY STIGMAEIDAE OUDEMANS, 1931 (ACARI: TROMBIDIFORMES) IN MARAND REGION (EAST-AZERBAIJAN PROVINCE) WITH ONE NEW SPECIES OF THE GENUS *EUSTIGMAEUS* BERLESE, 1910	NAVAEI-BONAB REZA
P 42	FAUNA OF THE FAMILY PSEUDOCHEYLIDAE (ACARI: TROMBIDIFORMES) OF MARAND (NORTHWEST OF IRAN) WITH ONE NEW SPECIES TO SCIENCE	NAVAEI-BONAB REZA
P 43	MITES OF THE SUPERFAMILY RHAPHIGNATHOIDEA (ACARI: PROSTIGMATA) IN WESTERN PROVINCES OF IRAN	NAZARI ALIREZA
P 44	FAUNA OF TERRESTRIAL PARASITENGONE MITES IN GUILAN PROVINCE, IRAN	NOEI JAVAD

16:00-16:30

Coffee break

PHYSIOLOGY & TOXICOLOGY

Chair: Khalil Talebi Jahromi & Salil Kumar Gupta

16:30-16:45

ASIF QAYYOUM MUHAMMAD - EFFICACY OF DIFFERENT PLANT EXTRACTS AGAINST STORED GRAIN MITES OF FAMILY ACARIDAE

16:45-17:00
KAVEH MARYAM - OVICIDAL, LARVICIDAL AND ADULTICIDAL EFFECTS OF ESSENTIAL OIL OF *SALVIA SAHENDICA* (LAMIACEAE) ON *TETRANYCHUS URTICAE* KOCH (ACARI: TETRANYCHIDAE)

VETERINARY & MEDICAL ACAROLOGY
17:00-17:15
HAMMED AMEEN - A SURVEY OF IXODID TICKS ON CATTLE, SHEEP AND GOATS AND THEIR SEASONAL ABUNDANCE IN ERBIL GOVERNORATE DURING THE YEAR 2010

TAXONOMY & BIODIVERSITY
17:15-17:30
RAZAVI SUSAN NASTARAN - LAELAPID MITES (ACARI: MESOSTIGMATA) ASSOCIATED WITH SCARAB BEETLES (SCARABAEIDAE: COLEOPTERA) IN ALBORZ PROVINCE, IRAN

Friday, 30 August 2013

Invited speakers

09:00-09:30
Dariusz Gwiazdowicz – Borders and problems of acarology

09:30-10:00
Salil Kumar Gupta – Documentation, economic importance of mites infesting medicinal plants in India and their management with bio-pesticides including phyto-pesticide and entomo-pathogenic fungi
.

10:00-10:30
Coffee break

BIOLOGY, ECOLOGY & ETHOLOGY

Chair: Yaghub Fathipour & Marjan Seiedy

10:30-10:45
BOHLOOLZADEH MEHDI - REARING CONDITION AND ITS EFFECT ON THE OLFACTORY RESPONSES OF *AMBLYSEIUS SWIRSKII* (ATHIAS-HENRIOT) (ACARI: PHYTOSEIIDAE)

10:45-11:00
DEHGHANI HAMIDEH - MATING EXPERIENCE AFFECTS MATING PRECEDENCE IN *P. PERSIMILIS*

11:00-11:15
HAGHANI SOMAYEH - INTRAGUILD PREDATOR AGGRESSIVENESS TOWARDS ITS HETEROSPECIFIC LARVAE

11:15-11:30
JAFARI SHAHRIAR - COMPARATIVE REPRODUCTIVE PERFORMANCE OF *NEOSEIULUS BARKERI* (ACARI: PHYTOSEIIDAE) AT SEVEN CONSTANT TEMPERATURES FED ON TWO-SPOTTED SPIDER MITE

11:30-11:45
MOGHADASI MONA - EFFECTS OF INJURED CONSPECIFICS ON BIOLOGY AND OVIPOSITION RATE OF *TETRANYCHUS URTICAE* (ACARI: TETRANYCHIDAE) ON ROSE LEAVES

11:45-12:00
REZAIE MARYAM - PREY PREFERENCE OF *NEOSEIULUS CALIFORNICUS* (MCGREGOR) (ACARI: PHYTOSEIIDAE) BETWEEN *TETRANYCHUS URTICAE* KOCH AND *FRANKLINIELLA OCCIDENTALIS* (PERGANDE) ON DIFFERENT STRAWBERRY CULTIVARS

ECOLOGY & BIOCONTROL
Chair: Azadeh Zahedi Golpayegani & Shahriar Jafari
12:00-12:15
SAMIRA KHODAYARI - EFFECT OF RAPID COLD HARDENING ON THE COLD HARDINESS OF THE TWO-SPOTTED SPIDER MITE, *TETRANYCHUS URTICAE*

12:15-12:30
SHEMSHADIAN ATIE - INVESTIGATION OF PREY PREFERENCE IN *NEOSEIULUS CALIFORNICUS* (ACARI: PHYTOSEIIDAE) TO HEALTHY AND *BEAUVERIA BASSIANA*-INFECTED ADULTS OF *AMPHITETRANYCHUS VIENNENSIS* (ACARI: TETRANYCHIDAE) IN AN OLFACTOMETER SYSTEM

12:30-14:30
Lunch

14:30-16:00
Poster session 2

Code	TITLE	CORRESPONDING AUTHOR
	TAXONOMY & BIODIVERSITY	
P 01	FAUNA OF PROSTIGMATIC PREDATORY MITES IN FRUIT ORCHARDS OF TORBATE-JAM COUNTY, KHORASAN RAZAVI PROVINCE, IRAN	RAHMDELI AMENEH
P 02	FAUNISTIC STUDY OF TENUIPALPIDAE (ACARI: PROSTIGMATA) IN NORTH OF IRAN (MAZANDARAN PROVINCE)	RAISSI ARDALI MOHAMMAD
P 03	MITES OF THE FAMILY LAELAPIDAE (ACARIA: MESOSTIGMATA) IN NEYRIZ REGION FARS PROVINCE IRAN	BAZRAFSHAN SAEIDEH
P 04	FAUNA OF TERRESTRIAL PARASITENGONA (ACARI: TROMBIDIFORMES) MITES ECTOPARASITIC ON MITES IN EAST MAZANDARAN PROVINCE – IRAN	SAMANIPOUR MAHSA
P 05	NEW RECORDS OF THE FAMILY LAELAPIDAE (ACARI: MESOSTIGMATA) FROM GUILAN PROVINCE AND A NEW RECORD FOR IRAN	RAMROODI SARA

P 06	THE FIRST NON-ARTHROPOD HOST FOR LEPTUS LATREILLE, 1796 (ACARI: ERYTHRAEIDAE)	SEIEDY MARJAN
P 07	FIRST REPORT OF THE FAMILY ASTERNOSEIIDAE (ACARI: MESOSTIGMATA: TRIGYNASPIDA) FROM IRAN	KAZEMI SHAHROOZ
P 08	*EPICRIUS TAURICUS* BREGETOVA, FIRST SPECIES REPORTED FROM THE FAMILY EPICRIIDAE (ACARI: MESOSTIGMATA) IN IRAN	PAKTINAT SAEEJ SAEID
P 09	FIRST REPORT OF THE GENUS *PELETHIPHIS* BERLESE (ACARI: MESOSTIGMATA: EVIPHIDIDAE) FROM IRAN	KAZEMI SHAHROOZ
P 10	THE LAELAPIDAE MITES (ACARI: MESOSTIGMATA) FROM MAZANDARAN PROVINCE, NORTH IRAN	ASMA RAJAEI
P 11	SOME MESOSTIGMATIC MITES (ACARI: MESOSTIGMATA) FROM ASALUYEH AND LENGEH PORTS, SOUTH IRAN	KAZEMI SHAHROOZ
P 12	FIRST REPORT OF *EVIPHIS OSTRINUS* (KOCH) (ACARI: MESOSTIGMATA: EVIPHIDIDAE) FROM IRAN	AHANGARAN YAZDANFAR
P 13	FIRST RECORD OF THE *PAVANIA CARABIDOPHILA* KHAUSTOV, 2005 (ACARI: DOLICHOCYBIDAE) FROM IRAN	TASHAKOR SAMANEH
P 14	FIRST RECORD OF THE GENUS *SILPHITROMBIUM* (ACARI: PARASITENGONA: NEOTHROMBIIDAE) FROM IRAN	TASHAKOR SAMANEH
P 15	FIRST REPORT OF THE GENUS *TANAUPODUS* (ACARI: TANAUPODIDAE) AND CORRECTION OF PREVIOUS REPORT OF THIS FAMILY FROM IRAN	YAZDANPANAH SHIMA
P 16	SARCOPTIFORMES MITES ASSOCIATED WITH STORED FOOD PRODUCTS IN MASHHAD, NORTH EAST OF IRAN	KHALEGHABADIAN ZOHREH
P 17	FAUNA OF PREDATORY MITES ASSOCIATED WITH STORED FOOD MITES IN THE NORTH EAST OF IRAN	KHALEGHABADIAN ZOHREH
P 18	A REPORT OF A NEW HOST OF PREDATORY MITE, *CHELETOGENES ORNATUS,* ON ARMORED SCALE *MERCETASPIS HALLI,* IN CHAHARMAHAL AND BAKHTIARI PROVINCE ON FRUIT TREES	NAJMEH KIANPOOR
P 19	CHEYLETID MITES (ACARI: TROMBIDIFORMES) IN STORED GRAINS IN IRAN	FARIBA ARDESHIR
	BIOLOGICAL CONTROL	
P 20	BIOLOGICAL TRAITS OF PHYTOSEIUS PLUMIFER (ACARI: PHYTOSEIIDAE) FED ON RHYNCAPHYTOPUS FICIFOLIAE (ACARI: DIPTILOMIOPIDAE) AT LABORATORY CONDITION	LOUNI, MOJDEH
P 21	SPATIAL DISTRIBUTION AND POPULATION FLUCTUATION OF TWO PHYTOPHAGOUS MITES AND ITS NATURAL PREDATOR IN AN UNSPRAYED APPLE ORCHARD OF KHORRAMABAD, WESTERN IRAN	M. RAHMATI
P 22	VIRULENCE OF ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA* AGAINST THE EUROPEAN RED MITE, *PANONYCHUS ULMI* (KOCH) (ACARI: TETRANYCHIDAE)	SHEMSHADIAN ATIE
P 23	THE RELEASE RATIO OF *NEOSEIULUSCUCUMERIS*OUDEMANS (ACARI: PHYTOSEIIDAE)TO CONTROL TWO SPOTTED SPIDER MITE *TETRANYCHUSURTICAE*KOCH (ACARI: TETRANYCHIDAE) ON STRAWBERRY IN GREENHOUSE CONDITIONS	SOROURI FARZANEH
P 24	THE EFFECT OFSEPARATE USE OF *NEOSEIULUSCUCUMERIS*OUDEMANS (ACARI: PHYTOSEIIDAE) AND ACARICIDE AND THEIR INTEGRATED IN CONTROL OF TWO SPOTTED SPIDER MITE *TETRANYCHUSURTICAE* KOCH (ACARI: TETRANYCHIDAE) ON STRAWBERRY IN GREENHOUSE CONDITIONS	SOROURI FARZANEH
P 25	EFFECT OF PREDATION ACTIVITY OF *NEOSEIULUS CALIFORNICUS*, *TYPHLODROMUS BAGDASARJANI* (PHYTOSEIIDAE) AND *SCOLOTHRIPS LONGICORNIS* (THRIPIDAE) ON POPULATION DENSITY OF ADULT FEMALES OF TWO-SPOTTED SPIDER MITE UNDER MICROCOSM CONDITIONS	AZADEH FARAZMAND
	BIOLOGY, ECOLOGY & ETHOLOGY	
P 26	INFLUENCE OF FEEDING ON SOME POLLENS ON	BARZEGARI

	BIOLOGY OF *EUSEIUS FINLANDICUS* (OUDEMANS) (ACARI: PHYTOSEIIDAE)	
P 27	HYPERPHORESY, A RARELY KNOWN BEHAVIOR IN MITES	BEYZAVI GHOLAMREZA
P 28	A NEW CASE OF PHORESY IN FREE LIVING CHEYLETID MITES	BEYZAVI GHOLAMREZA
P 29	THE EFFECT OF KINSHIP ON MATING PRECEDENCE: DOES *PHYTOSEIULUSPERSIMILIS* AVOID MATING WITH KIN?	DEHGHANI HAMIDEH
P 30	THE EFFECT OF TERRITORY ON *PHYTOSEIULUSPERSIMILIS* MATING COMBAT	DEHGHANI HAMIDEH
P 31	BIOLOGY OF *TRISETACUS EHMANNI* (KEIFER) (PROSTIGMATA: ERIOPHYOIDEA: PHYTOPTIDAE) ON PINE TREES IN MASHHAD CITY	GHAREZADEH MARYAM
P 32	FEEDING BEHAVIOR OF *PHYTOSEIUS PLUMIFER* (PHYTOSEIIDAE) ON *EOTETRANYCHUS HIRSTI* (TETRANYCHIDAE) AND *RHYNCAPHYTOPUS FICIFOLIAE* (DIPTILOMIOPIDAE) IN LABORATORY CONDITION	LOUNI MOJDEH
P 33	FUNCTIONAL RESPONSE OF *NEOSEIULUS BARKERI* HUGHES ON TWO-SPOTTED SPIDER MITE (ACARI: TETRANYCHIDAE)	MALEKNIA BAHADOR
P 34	BIOLOGY AND FECUNDITY PARAMETERS OF *TYPHLODROMUS BAGDASARJANI* AND *PHYTOSEIULUS PERSIMILIS* (ACARI: PHYTOSEIIDAE) FED ON *TETRANYCHUS URTICAE* (ACARI: TETRANYCHIDAE) ON ROSE	MOGHADASI MONA
P 35	NON-LETHAL EFFECTS OF *TYPHLODROMUS BAGDASARJANI PHYTOSEIULUS PERSIMILIS* (ACARI: PHYTOSEIIDAE) ON *TETRANYCHUS URTICAE* (ACARI: TETRANYCHIDAE) ON ROSE LEAVES	MOGHADASI MONA
P 36	LIFE TABLE PARAMETERS OF TWOSPOTTED SPIDER MITE, *TETRANYCHUSURTICAE* (ACARI: TETRANYCHIDAE) ON DIFFERENT COTTON CULTIVARS	RABIEI AMENEH
P 37	THE FECUNDITY POTENTIAL OF *NEOSEIULUS CALIFORNICUS* (MCGREGOR) (ACARI: PHYTOSEIIDAE) ON DIFFERENT STRAWBERRY CULTIVARS	REZAIE MARYAM
P 38	POPULATION FLUCTUATION OF *TETRANYCHUS URTICAE* KOCH (ACARI: TETRANYCHIDAE) ON DIFFERENT STRAWBERRY CULTIVARS	REZAIE MARYAM
P 39	THE EFFECT OF MEDICINAL PLANT ON LIFE TABLE OF *TETRANYCHUS URTICAE* (ACARI: TETRANYCHIDAE)	SAFFARI MAHSA
P 40	PREY PREFERENCE OF *PHYTOSEIULUS PERSIMILIS* ATHIAS- HENRIOT TOWARDS SALUTARY AND INFECTED SPIDER MITES ON LEAF	SEIEDY MARJAN
P 41	ANALYSIS OF PREY PREFERENCE IN *NEOSEIULUS CALIFORNICUS* (ACARI: PHYTOSEIIDAE) TO HEALTHY AND *BEAUVERIA BASSIANA*-INFECTED ADULTS OF *PANONYCHUS ULMI* (ACARI: TETRANYCHIDAE) IN AN OLFACTOMETER SYSTEM	SHEMSHADIAN ATIE
P 42	INFLUENCE OF FIVE POLLENS AND ONE PREY DIETS ON SOME BIOLOGICAL CHARACTERISTICS OF *TYPHLODROMUS BAGDASARJANI* ARUTUNJAN AND WAINSTEIN (ACARI: PHYTOSEIIDAE)	SHIRDEL
	PHYSIOLOGY &TOXICOLOGY	
P 43	REPELLENT EFFECT OF *PRUNUS LAUROCERASUS* L. (ROSACEAE) EXTRACT AGAINST *TETRANYCHUS URTICAE* KOCH (PROSTIGMATA: TETRANYCHIDAE)	AKYAZI RANA
P 44	OVIPOSITION DETERRENCE OF NANOENCAPSULATED *OF CUMINUM CYMINUM* ESSENTIAL OIL ON CITRUS RED MITE	BASHIRI MOHAMMAD
P 45	OVICIDAL EFFICACY OF *CITRUS SINENSIS*, *CUPRESUS MACROCARPA* AND *EUCALYPTUS CAMALDULENSIS* ESSENTIAL OILS AGAINST *TETRANYCHUS URTICAE*	SHARIATI FAEZE

16:00-16:30

Coffee break

ECOLOGY & BIOCONTROL
Chair: Azadeh Zahedi Golpayegani & Shahriar Jafari

16:30-16:45
Salil Kumar Gupta – A conspectus of mites infesting floricultural and horticultural plants in West Bengal, India

16:45-17:00
MALEKNIA BAHADOR - INTRAGUILD PREDATION AMONG THE PREDATORY MITES *NEOSEIULUS BARKERI*, *PHYTOSEIULUS PERSIMILIS* AND *AMBLYSEIUS SWIRSKII*, NATURAL ENEMIES OF THE TWO SPOTTED SPIDER MITE

17:00-17:15
RAHMANI HASAN - INTRAGUILD PREDATION AMONG ONE NON-NATIVE AND TWO NATIVE PHYTOSEIID PREDATORS OF IRAN IN THE PRESENCE OF *TETRANYCHUS URTICAE*

17:15-17:30
SEIEDY MARJAN - COMPARATIVE VIRULENCE OF DIFFERENT ISOLATES OF THE ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA* AGAINST *PHYTOSEIULUS PERSIMILIS* (ACARI: PHYTOSEIIDAE)

TAXONOMY & BIODIVERSITY
Chair: Enrico de Lillo, Maria Lordes Moraza & Dariusz Gwiazdowicz

17:30-17:45
Asif Qayyoum Muhammad - A NEW RECORD OF THE PEPREDATORY MITE SPECIES OF THE GENUS *AGISTEMUS* (ACARI: STIGMAEIDAE) FROM PAKISTAN

17:45-18:00
AHADIYAT ALI - FIRST REPORT OF THE GENUS *PARALEIUS* TRAVÉ, 1960 (SARCOPTIFORMES: ORIBATIDA: HEMILEIIDAE) ASSOCIATED WITH BARK BEETLES FROM ASIA

18:00-18:15
LOTFOLLAHI PARISA - NEW RECORDS FOR THE ERIOPHYID (TROMBIDIFORMES: ERIOPHYOIDEA: ERIOPHYIDAE) MITE FAUNA OF ORCHARDS IN IRAN (SOUTHWEST OF EAST AZERBAIJAN PROVINCE)

18:15-18:30
MOHAMMAD ALI AKRAMI - INTRODUCTION OF SOME ORIBATID MITES ASSOCIATED WITH THE DATE PALMS IN LARESTAN, FARS PROVINCE (SOUTHERN IRAN)

18:30-19:00

Coffee break

19:00-19:30
Photo Exhibition

19:30-20:30
Free discussion time

Gala dinner

Saturday, 31 August 2013

8:30-10:00
Annual meeting of the Acarological Society of Iran (in Persian)

10:00-10:30
Cake & Coffee break

10:30-12:00
Closing ceremony

12:00-13:00
Lunch

13:00-17:00
Museum visit (Sa'ad Abad Palace)

TAXONOMY & BIODIVERSITY

Introduction of seven mites species of the families Ascidae and Blattisociidae (Acari: Mesostigmata) collected on eriophyoid mites (Acari: Eriophyidae) infested plants in Guilan Province, Iran

Seiied Mohammad ADELI, Jalil HAJIZADEH and Reza HOSSEINI
Department of Plant Protection, Faculty of Agricultural Sciences, University of Guilan, Rasht, Iran. E-mail: mohammad.adeli6@yahoo.com

Mites of family Eriophyidae are obligated herbivores and feed on variety of plants. They commonly have known as gall, bud, blister and rust mites in reference to their feeding injuries to plant tissues. Some are of agricultural importance, because of the plant abnormalities caused by them or for the plant viruses which they transmit. During 2012, a faunistic survey was conducted for collection and identification of predatory mites associated with eriophyid mites in Guilan Province, north of Iran. Predatory mites were extracted by placing infested plant foliage in a Berlese-Tullgren funnel or by direct examination under a stereomicroscope. The mites were cleared in Nesbitt's solution and mounted in Hoyer's medium on microscopic slides. Seven species of ascid and blattisociid mites were collected on the eriophyid mites infested leaves in Guilan Province. The list of predatory species based on associated eriophyid mites is as follows:

Acaphylla distata (Keifer, 1961); *Aculops rhodensis* (Keifer, 1957), *Protogamasellus mica* (Athias-Henriot, 1961) [Ascidae], *Aceria ficus* (Cotte, 1920); *Aculus epiphyllus* (Nalepa, 1892); *Calepitrimerus baileyi* Keifer, 1938; *Colomerus vitis* (Pagenstecher, 1857); *Diptacus giganorhynchus* (Nalepa, 1892), *Lasioseius frankbakkeri* Faraji and Karg, 2005 [Blattisociidae], *Aceria granati* (Canestrini and Massalongo, 1894), *Cheiroseius longipes* (Willmann, 1951) [Blattisociidae], *Aceria geranii* (Canestrini, 1891), *Arctoseius cetratus* (Sellnick, 1940) [Ascidae], *Aceria oleae* (Nalepa, 1900); *Tegonotus hassani* (Keifer, 1959), *Protogamasellus massula* (Athias-Henriot, 1961) [Ascidae], *Calepitrimerus baileyi* Keifer, 1938, *Lasioseius extremus* (Daneshvar, 1987) [Blattisociidae], *Eriophyes pyri* (Pagenstecher, 1857), *Lasioseius youcefi* Athias-Herlese, 1959 [Blattisociidae]

Key words: Ascidae, Blattisociidae, eriophyoid mites, natural enemies, Guilan Province.

Introduction of nine predatory phytoseiid mites (Acari: Phytoseiidae) species associated with *Aceria erineus* (Nalepa) (Acari: Eriophyidae) in Guilan Province, Iran

Seiied Mohammad ADELI, Jalil HAJIZADEH and Reza HOSSEINI
Department of Plant Protection, Faculty of Agricultural Sciences, University of Guilan, Rasht, Iran. E-mail: mohammad.adeli6@yahoo.com

The walnut erinum mite, *Aceria erineus* (Nalepa) is the most common and injurious eriophyid mite found on *Juglans regia* L. This pest distributed in most walnut planting area in Guilan Province, northern Iran. Due to the lack of chemical control of walnut tree pests, activity of natural enemies is impressive in the area. During 2012, a faunistic survey was carried out for collection and identification of natural enemies of walnut eriophyid mites in Guilan Province. Predatory mites were extracted by placing infested plant foliage in a Berlese-Tullgren setup or direct examination using stereo-microscope. The mites were cleared in Nesbitt's fluid and were mounted in Hoyer's medium on microscope slides. Nine phytoseiid mites were collected and identified in association with walnut erinum mite. Identified species are as follows:
Subfamily Amblyseiinae: *Amblyseius herbicolus* (Chant, 1959), *Euseius amissibilis* (Meshkov, 1991), *Euseius finlandicus* (Oudemans, 1915), *Transeius wainsteini* (Gomelauri, 1968); Subfamily Phytoseiinae: *Phytoseius plumifer* (Canestrini and Fanzago, 1876); Subfamily Typhlodrominae: *Neoseiulella tiliarum* (Oudemans, 1930), *Paraseiulus soliger* (Ribaga, 1904), *Paraseiulus triporus* (Chant and Yoshida-Shaul, 1982), *Typhlodromus caudiglanns* (Schuster, 1959)

Key words: *Aceria erineus*, *Juglans regia*, natural enemies, Phytoseiidae, Guilan Province.

First report of the genus *Paraleius* Travé, 1960 (Sarcoptiformes: Oribatida: Hemileiidae) associated with bark beetles from Iran

Ali AHADIYAT[1], Mohammad Ali AKRAMI[2]
1. Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mail: a.ahadiyat@srbiau.ac.ir; 2. Department of Plant Protection, Faculty of Agriculture, Shiraz University, Shiraz, Iran. akrami@shirazu.ac.ir

Many species of bark beetles of the subfamily Scolytinae (Coleoptera: Curculionidae) are important pests of fruit, ornamental and forest trees and shrubs. These destructive pests and their galleries provide diverse habitats for many mite species of different groups with various food habits. During extensive investigations on mites associated with the Mediterranean pine engraver beetle, *Orthotomicus erosus* (Wollaston, 1857), in Alborz and Tehran Provinces, during the years 2006–2010, some specimens of an oribatid mite, were collected from galleries and identified as *Paraleius leontonychus* (Berlese, 1910) (Hemileiidae). Both female and male specimens of this species were extracted using Berlese-Tullgren funnel, then cleared in lactophenol and mounted on microscope slides using Hoyer's medium. This is the first record of these genus and species for the mite fauna of Iran, and also the first report of them in association with *O. erosus*. Literature reviews showed that it is an arboreal mite living on and under tree bark or associated with bark beetle species, in some parts of the world. There is not any record of this species in relation to bark beetles in some continents, and this is likely the first record of this oribatid mite associated with bark beetles in Asia.

Key words: Oribatida, *Paraleius leontonychus*, bark beetle galleries, Iran.

Introduction of some mesostigmatic and astigmatic mites associated with the date palms in Larestan, (Fars Province), Southern Iran

Maryam MAJIDI and Mohammad Ali AKRAMI
Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz, Iran. E-mail: akramima@yahoo.com

This study deals with the members of mesostigmatic and astigmatic mites (Acari: Mesostigmata; Astigmata) associated with date palm (*Phoenix dactylifera* L.) in Larestan, Fars Province, southern Iran. Mites inhabiting date palms (leaves, fruits, trunk fiber and soil) were studied during 2009–2010. The present study has been revealed records of 14 species of mesostigmatic mites belonging to eight families and one species of astigmatic mites associated with date palm from southern Iran. Among them, six genera and nine species that are marked by one asterisk are new records for date palm fauna of the world. All species are considered as new records for Larestan region.
Acaridae: *Tyrophagus putrescentiae* Schrank, 1781, Urodinychidae: *Uroobovella* obovata** Canestrini & Berlese, 1884, Ologamasidae: *Gamasiphis** sp.; Phytoseiidae: *Neoseiulus astutus** (Beglyarov, 1960), *Neoseiulus marginatus* (Wainstein, 1961), *Neoseiulus bicaudus* (Wainstein, 1962), *Typhlodromus vulgaris** Ehara, 1959; Parasitidae: *Parasitus* sp.; Rhodacaridae: *Rhodacarellus* iraniensis** Castilho, Jalaeian & de Moraes, 2012, *Multidentorhodacarus* saboorii** Castilho, Jalaeian & de Moraes, 2012; Laelapidae: *Gaeolaelaps aculeifer* (G. Canestrini, 1884), *Gaeolaelaps minor** (Costa, 1968), *Gaeolaelaps* sp.; Macrochelidae: *Macrocheles** sp.; Sejidae: *Sejus** sp.

Key words: Mesostigmata, Astigmata, mite, date palm, Larestan, Iran.

Introduction of some oribatid mites associated with the date palms in Larestan, Fars Province (Southern Iran)

Maryam MAJIDI and Mohammad Ali AKRAMI
Department of Plant Protection, College of Agriculture, Shiraz University, Shiraz, Iran. E-mail: akramima@yahoo.com

This study deals with oribatid mites (Acari: Oribatida) associated with the date palm (*Phoenix dactylifera* L.) in Larestan, Fars Province, southern Iran. Mites inhabiting date palms (leaves, fruits and trunk fiber) and the surrounding soil were studied during 2009–2011. The present study revealed records of 16 species of oribatid mites belonging to 12 families associated with date palms from Iran. Among them, 11 genera and 14 species (marked by one asterisk) are new records for date palm fauna of the world. All species are new records for Larestan region.
1) Aphelacaridae: *Aphelacarus* acarinus** (Berlese, 1910); 2) Cosmochthoniidae: *Phyllozetes* tauricus** Gordeeva, 1978; 3) Euphthiracaridae: *Acrotritia* ardua** (Koch, 1841); 4) Lohmanniidae: *Lohmannia* (*Lohmannia*) *turcmenica* Bulanova-Zachvatkina, 1960; 5) Epilohmanniidae: *Epilohmannia cylindrica cylindrica* (Berlese, 1904); 6) Haplochthoniidae: *Haplochthonius* (*Haplochthonius*) *sanctaeluciae** Bernini, 1973; 7) Microzetidae: *Berlesezetes** sp.; 8) Oppiidae: *Lasiobelba** (*Antenoppia*) *heterosa** (Wallwork, 1964), *Discoppia* (Cylindroppia) cylindrica** (Perez-Inigo, 1965), *Multioppia** (*Multioppia*) sp.; 9) Gymnodamaeidae: *Plesiodamaeus* ornatus** Perez-Inigo, 1972; 10) Scheloribatidae: *Scheloribates* (*Scheloribates*) *fimbriatus** Thor, 1930; 11) Galumnidae: *Galumna* (*Galumna*) *karajica** Mahunka and Akrami, 2001; 12) Haplozetidae: *Trachyoribates** (*Rostrozetes*) *persiangulfi** Akrami, Majidi and Behmanesh, 2011, *Baloghiella* granulata** Bayartogtokh & Akrami, 2000, *Protoribates* paracapucinus** (Mahunka, 1988).

Key words: Oribatida, mite, date palm, Larestan, Iran.

Cheyletid mites (Acari: Trombidiformes) in stored grains in Iran

Fariba ARDESHIR
Department of Zoology, Iranian Research Institute of Plant Protection, Tehran Iran. E-mail: f.Ardeshir@yahoo.com

Cheyletid mites in stored cereal were reviewed over the last 15 years (1996–2010). Some of these species of this family are predators of acarid mites and they were collected from silos, flour-mills, barn and rice-mill in 11 Provinces located in North, Central, East and West of Iran and then identified. In this study, nine genera and 11 species are identified as follows: *Acaropsellina sollers* (Kuzin, 1940), *Cheletomorpha lepidopterorum* (Show, 1794), *Cheyletus bidentatus* Fain & Nadchatrum, 1980, *Cheyletus carnifex* Zachvatkin, 1935, *Cheyletus eruditus* (Schrank, 1781), *Cheyletus malaccensis Oudemans*, 1903, *Cheyletus trouessarti* Oudemans, 1903, *Culifella variegate* (Barilo, 1985), *Eucheyletia* sp., *Lepidocheyla* sp., *Nodele calamondin* Muma, 1964, *Neocheyla iranica* Fain & Ardeshir, 2000, *Zachvatkiniola reticulate* (Cunliffe, 1962). The most distributed mites were *Cheyletus malaccensis* and *Acaropsellina sollers*. The most common species on wheat and rice was *Cheyletus malaccensis*.

Key words: Acariformes, Prostigmata, stored grains.

First record of *Cheiroseius unguiculatus* (Berlese) (Mesostigmata: Blattisociidae) from Iran

Elham ARJOMANDI[1], Shahrooz KAZEMI[1] and Asma RAJAEI
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: elham.arjomand@yahoo.com

The family Blattisociidae is a diverse group of mesostigmatic mites that are found in terrestrial, arboreal and subaquatic habitats. The blattisociid mites of *Cheiroseius* (Berlese, 1877) are usually free-living predators and have important role in biological control. So far, 35 species of six genera of the family Blattisociidae are reported from Iran of which nine species belonging to the genus *Cheiroseius* that one of them, *C. sistaniensis* Faraji, Arjmandi-Nezhad & Karg., 2008, was described as new for science. In a faunistic study on edaphic mesostigmatans in Golestan Province (North of Iran) in 2011, *C. unguiculatus* (Berlese, 1877) was extracted from leaf litter in Ziarat Village. This species can be distinguished by a combination of the following features: dorsal setae in medio-central part are shorter than lateral setae (except J4 and J3), lateral setae are curved and lanceolate, sternal shield with net-like pattern, centro-medial part of shield with oblong braid pattern, peritremes caudally extended past stigmata and reaching behind coxa IV, leg I without pretarsus. This species is considered as a new record for Iran mite fauna.

Key words: Mesostigmata, Blattisociidae, *Cheiroseius,* Iran.

A new predatory mite species of the genus *Agistemus* (Acari: Stigmaeidae) from Pakistan

Zahid MEHMOOD SARWAR, M. HAMID BASHIR, Bilal SAEED KHAN and Muhammad ASIF QAYYOUM
Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

Mites are minute arthropods and microscopic in size. They are present in wide range of habitat where life is possible. They are biologically the most diverse as abundant arachnids and worldwide in distribution in all types of habitat. Mites belonging to the family Stigmaeidae are well known predatory mites and used as bio-control agents for phytophagous mites and small soft bodied insects. A random survey was conducted to explore the mite fauna of district Narowal of Punjab Province (Pakistan). A new record of the genus *Agistemus, A. zahidi,* collected from different localities of district Narowal, is given. The collection was made from different parts of plants and leaf litter by sieve collection and Berlese funnel extraction methods. The collected mites preserved in vials containing 70% alcohol and few drops of glycerin. Specimen mounted on the glass slides with help of Hoyer's medium. The drawings of different body parts prepared with the help of ocular grid in a high power microscope. This specimen compared with already described two species. The description and illustration of main body parts, host range and comparison remarks are also given in this manuscript.

Key words: Stigmaeidae, predatory mite, *Agistemus,* Pakistan.

New species and records of family Cryptognathidae (Acari: Prostigmata: Raphignathoidea) from Iran

Mohammad BAGHERI[1], Saeed PAKTINAT SAEEJ[1] and Shiela SHIRINBEIK MOHAJER[2]
1. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran. E-mail: mbagheri 20022002@yahoo.com, 2. Department of Agriculture, Payame Noor University, Tehran, Iran.

Mites of the family Cryptognathidae Oudemans can be easily recognized by the presence of a protective hood anterior of the propodosoma and an extremely extendable gnathosomal base. In this family dorsal and ventral idiosoma each covered by a single shield. Mites of Cryptognathidae are predators or microphytophagus and usually collecting from soil, litter, mosses and lichens, and appear to be quite resistant to desiccation. Members of this family comprise more than 50 species in three genera, *Favognathus* Luxton, *Cryptognathus* Kramer and *Cryptofavognathus* Doğan & Dönel. In order to study the family Cryptognathidae in Gorgan, Amol and Mashad, mites were extracted from soil using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium and examined at 1000× magnification under an Olympus BX41 phase contrast microscope. In this study three species *Cryptognathus* sp. nov., *Favognathus pongolensis* Meyer & Ueckermann and *F. mirazii* Khanjani & Ueckermann were identified of which the genus *Cryptognathus* and also *F. pongolensis* were recorded for first time from Iran.

Key words: Cryptognathidae, Raphignathoidea, Prostigmata, *Favognathus, Cryptognathus*, Iran.

Cryptognathid mites (Acari: Trombidiformes: Cryptognathidae) of northwest Iran

Mohammad BAGHERI, Naser MALEKI, Gholamhossein GHAREKHANI and Mansoureh AHANIAZAD
Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran. E-mail: mbagheri 20022002@yahoo.com

Mites of the family Cryptognathidae Oudemans are frequently encountered in dry soil, but also occur in litter and soil, and on moss, lichens, tree barks, and plants. The family Cryptognathidae can be defined as follows: idiosoma flattened dorsoventrally, ornamented, with 11 pairs of dorsal body setae; pleural circumferential integument with a characteristic pattern; slit-like cupules instead of rounded cupules; a protective hood anterior of the propodosoma and an extremely extendable gnathosomal base. There are three genera in this family that members of the genus *Favognathus* Luxton, 1973 comprises more than 30 species. This genus is widely distributed in the world. It has been suggested that *Favognathus* mites are predator; however, recently they have been considered as microphytophages. In order to study the cryptognathid mites of northwest Iran, mites were collected and then extracted from soil and aerial parts of plants by using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium and slides were placed in oven at 45 °C for one week then examined at 1000× magnification under an Olympus BX41 phase contrast microscope. In this study, four species collected and identified of which one species was new and marked by one asterisk. The identified mites are as follows:
Favognathus luxtoni Koç & Ayyildiz, 1999; *F. distortus* Kuznetsov, 1974; *F. mirazii* Khanjani & Ueckermann, 2008; *Favognathus* sp. nov.*

Key words: Predatory mites, Cryptognathidae, *Favognathus*, Iran.

First record of the male of ectoparasitic mite *Coccipolipus macfarlanei* (Acari: Podapolipidae) on *Coccinella septempunctata* (Col.: Coccinellidae) from Iran

Morteza BAHRAMIAN, Hamidreza HAJIQANBAR and Ali Asghar TALEBI
Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran. E-mail: morteza.bahramian20@gmail.com

Mites of the genus *Coccipolipus* (Acari: Podapolipidae) are all specific parasites of the coccinellid beetles and all stages occur under the host elytra. The *Coccipolipus macfarlanei* Husband, 1972 is the most widespread species of the genus *Coccipolipus*. This species was first described by Husband in 1972. Mite fauna investigation of the cohort Heterostigmatina associated with insects in Semirom city, southern Isfahan Province in summer 2012, led to find a colony of *C. macfarlanei* parasitising *Coccinella septempunctata* (Col.: Coccinellidae). All life stages of the mite including adult female, larval female and male were observed. This is the first record of the male stage of the *C. macfarlanei* from Iran. Moreover, record of this species is new to mite fauna of Isfahan Province. The adult female and larval female of *C. macfarlanei* were previously found in Khorasan and Kerman Provinces.

Key words: *Coccipolipus macfarlanei*, Parasite, male, *Coccinella septempunctata,* Semirom.

Species composition of mites of the family Laelapidae (Acari: Mesostigmata) in the main climate zones of Tehran Province, Iran

Simin BAROOZEH[1], Ali AHADIYAT[1], Omid JOHARCHI[2] and Alimorad SARAFRAZI[3]
1. Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mails: siminbaroozeh @gmail.com and a.ahadiyat@srbiau.ac.ir; 2. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran, E-mail: joharchi@iauyazd.ac.ir; 3. Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection, Evin, Tehran, Iran, e-mail: asarafrazi@yahoo.com

The family Laelapidae comprises a multitude of morphologically and behaviorally diverse mites that are free living or associated with arthropods, mammals, or birds. During 2011–2012 studies on species composition of this family were carried out to collect and identify mites of this family in six main climate zones of Tehran Province. Samples were collected from habitats such as soil, leaf litter and dung in parks and green spaces in different areas of Tehran, Varamin, Shahr-e Rey, Firouzkooh, and in green spaces and orchards in the Damavand region. A total of 21 species from 8 genera belonging to 3 subfamilies was collected and identified as follows. Two species are new for the Iranian mite fauna and one belongs to a new species which are marked by one and two asterisks, respectively:

I. Subfamily Hypoaspidinae:
Cosmolaelaps lutegiensis (Shcherbak, 1971)
C. cf. *lutegiensis* (Shcherbak, 1971)
C. vacua (Michael, 1891)
C. claviger * (Berlese, 1882)
Cosmolaelaps sp. nov. **
Euandrolaelaps karawaiewi (Berlese, 1903)
E. sardoa (Berlese, 1911)
Gaeolalaps aculeifer (Canestrini, 1884)
G. angusta (Karg, 1962)
G. asperatus (Costa, 1968)
G. minor (Costa, 1968)
G. praesternalis (Willmann, 1949)
G. queenslandicus (Womersley, 1956)
G. sclerotarsus (Costa, 1968)
Pseudoparasitus missouriensis (Ewing, 1909)
II. Subfamily Laelapinae:
Androlaelaps sp.
Haemolaelaps shealsi (Costa, 1968)
Haemolaelaps casalis (Berlese, 1887)
Haemolaelaps sp.
III. Subfamily Melittiphidinae:
Laelaspisella canestrinii (Berlese, 1903)
Laelaspis sp.

Arc GIS (ver.9.3) software was used in data analyses process and the samples of this family were found in Arid-Cool winter-Warm summer (A-C-W), Semi Arid-Cold winter-Warm summer (SA-K-W) and Semi Arid-Cool winter-Warm summer (SA-C-W) climate zones. The climate zone SA-K-W had the highest diversity and most abundance of mite species. Among the species, *G. aculeifer* was the most abundant species that was distributed in every three climate zones.

Key words: Mite, species composition, Laelapidae, Tehran, climate zone.

Mites of the family Laelapidae (Acari: Mesostigmata) in Neyriz Region, Fars Province, Iran

Saeideh BAZRAFSHAN[1], Abolfazl DOSTY[1] and Omid JOHARCHI[2]
1. Department of Entomology, Science and Research Branch, Islamic Azadi University, Jahrom Iran. E-mail: Saeedeh. bazrafshan@yahoo.com; Fdousti@yahoo.com; 2. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. E-mail: j.omid2000@gmail.com; joharchi@iauyazd.ac.ir

The mite family Laelapidae is ecologically diverse, including obligate and facultative parasites of vertebrates, insect paraphages, and free-living predators that inhabit soil-litter habitats and the nests of vertebrates and arthropods. During 2011–2012, the fauna of Laelapidae (Acari: Mesostigmata) was studied in Neyriz region of Fars Province. Soil samples were taken from different regions. Mites were extracted by Berlese funnels. In this study, 15 species belonging to six genera were identified. One species is new record for the Iranian mite fauna (marked by one asterisk).
Cosmolaelaps lutegiensis (Shcherbak, 1971), *Cosmolaelaps vacua* (Michael, 1891), *Cosmolaelaps ornatus* Berlese, 1903*, *Cosmolaelaps* sp. nov., *Euandrolaelaps karawaiewi* (Berlese, 1903), *Euandrolaelaps sardoa* (Berlese, 1911), *Gaeolaelaps nolli* (Karg, 1962), *Gaeolaelaps aculeifer* (Canestrini, 1884), *Gaeolaelaps kargi* (Costa, 1968), *Gaeolaelaps minor* (Costa, 1968), *Laelaspisella canestrinii* (Berlese, 1903), *Haemolaelaps casalis* (Berlese, 1887), *Laelaspis dariusi* Joharchi & Jalaeian, 2012, *Laelaspis astronomicus* (Koch, 1839), *Pseudoparasitus missouriensis* (Ewing, 1909),

Key words: Laelapidae soil, Iran, Fars Province.

Fauna of bdelloid and raphignathoid mites (Acari: Trombidiformes) in Rodbar-Ghasran region (Shemiranat), Tehran Province, Iran

Zahra CHERAGHALI[1], Jinoos RASTEGAR[2], Hamid SAKENIN-CHELAV[3], Mohammad BAGHERI[4] and Jianzhen LIN[5]
1. Young Researchers club, Garmsar Branch, Islamic Azad University, Garmsar, Iran. E-mail: Z_cheraghali2005@ yahoo.com; 2. Department of Entomology, Garmsar Branch, Islamic Azad University, Garmsar, Iran. E- mail: jinoosrastegar@yahoo.com; 3. Department of Plant Protection, Qaemshahr branch, Islamic Azad University, Qaemshahr, Iran. E- mail: hchelave@yahoo.com; 4. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Iran. E-mail: mbagheri20022002@yahoo.com; 5. Institute of Plant Protection, Fujian Academy of Agricultural Sciences Pudan, Xindian, Fuzhou 350013, China. E-mail: jianzhenlin@126.com.

During 2010–2011, the fauna of bdelloid and raphignathoid mites (Acari: Trombidiformes) in Rodbar-Ghasran region (Shemiranat) in Tehran Province were studied. Some samples were taken from soil, litter and decayed plants from different parts of that area. Mites were extracted by Berlese-Tullgren funnel and cleared in lactophenol fluid. Microscopic slides were prepared using Hoyer's medium. In this study, five family, 10 genera and 11 species of predatory mites were identified which are listed as follows. All identified species are new records for the mite fauna of Rodbar-Ghasran region.
Bdellidae Dugès, 1834: *Bdella muscorum* Ewing, 1909, *Cyta latirostris* (Hermann, 1804), *Spinibdella cronini* (Baker & Balock, 1944); Cunaxidae Thor, 1902: *Cunaxa setirostris* (Hermann, 1804), *Cunaxoides croceus* (Koch, 1838); Caligonellidae Grandjean, 1944: *Molothrognathus azizi* Ueckermann & Khanjani, 2003, *Neognathus terrestris* (Summers & Schlinger, 1955); Raphignathidae Kramer, 1877: *Raphignathus gracilis* (Rack, 1962), *Raphignathus giselae* Meyer & Ueckermann, 1989; Stigmaeidae Oudemans, 1931: *Ledermuelleriopsis zahiri* Khanjani & Ueckermann, 2002, *Eustigmaeus segnis* (Koch, 1836)

Key words: Bdellidae, Cunaxidae, Caligonellidae, Raphignathidae, Stigmaeidae

Mite fauna associated with fig trees (*Ficus carica* L.) in Estahban (Fars Province), Iran

Negar DANESHNIA and Mohammad Ali AKRAMI
Department of Plant Protection, Faculty of Agriculture, Shiraz University, Shiraz, Iran; E-mails: negardaneshnia_83@yahoo.com; akrami@shirazu.ac.ir

This study deals with the mites of fig trees (*Ficus carica* L.) in Estahban, Fars Province, Iran. During 2010–2011, in the course of a faunistic survey of mites associated with fig trees, soil, leaves, fruits, and trunk samples were obtained. Samples were transferred into the Acarological laboratory of the Department of Plant Protection, College of Agriculture, Shiraz University. The mites were isolated using a Berlese funnel and examined under steriomicroscope. Specimens were removed and cleared in lactophenol and mounted in Hoyer's medium on glass microscopic slides for identification. The slides were placed in an oven at 45°C for 10 days and the specimens were then identified under a light microscope. Twenty eight species were identified that belonged to 25 genera and 23 families. The present study is the first report of fig mite species from Iran which are as follows:
Tetranychidae: *Eotetranychus hirsti* Pritchard and Baker, 1955; Rhyncaphytopidae: *Rhyncaphytoptus ficifoliae* Keifer, 1982; Raphignathidae: *Raphignathus giselae* Meyer and Ueckermann, 1989; *Raphignathus zhaoi* Hu, Jin and Liang, 1995; Cunaxidae: *Cunaxa setirostris* Hermann, 1804; Erythraeidae: *Erythraeus* sp.; Stigmaeidae: *Stigmause elongatus* Berlese, 1886; Bdellidae: *Spinibdella cronini* Baker & Balock, 1944; Anystidae: *Anystis baccarum* (L.), Eviphidadae: *Alliphis halleri* G.R. Canestrini, 1881; Veigaiidae: *Veigaia* sp. nr. *indica;* Laelapidae: *Gaeolaelaps aculifer* (Canestrini,1884); Phytoseiidae: *Proprioseiopsis* sp. nr. *messor* (Wainstein, 1960); *Typhlodromus* sp. nr. *cotoneastri* Wainstein, 1961; Acaridae: *Tyrophagus putrescentiae*, Schrank, 1781; Lohmanniidae: *Lohmannia loebli* Mahunka, 1974; *Papillacarus aciculatus* Kunts, 1959; Epilohmanniidae: *Epilohmannia cylindrica cylindrica* (Berlese, 1904); Nothridae: *Nothrus bicliatus* Koch, 1841; *Nothrus* sp.; Euphthiracaridae: *Acrotritia ardua* Koch, (1841); Gymnodamaeidae: *Plesiodamaeus* sp. nr. o*rnatus* Perez-Inigo, 1972; Tectocepheidae: *Tectocepheus velatus* (Michael, 1980); Oppiidae: *Lasiobelba* (*Antenoppia*) *heterosa* (Walwork, 1964); *Corynoppia* sp.; Protoribatidae: *Protoribates paracapucinus* (Mahunka, 1988); *Brasilobates* sp. nr. *maximus*; Oribatulidae: *Oribatula* (*Oribatula*) *pallida* Banks, 1906; Scheloribatidae: *Scheloribates fimbriatus* Thor, 1930; *Scheloribates* sp.; Galumnidae: *Galumna karajica* Mahunka & Akrami, 2001.

Key words: Fig tree, mite, fauna, Estahban, Fars Province.

First record of the genus and species *Ereynetoides amplectorus* (Acari: Ereynetidae) from Iran

Maryam DARBEMAMIEH[1], Hamidreza HAJIQANBAR[1] and Mohammad KHANJANI[2]
1. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, P.O. Box 14115-336, Tehran, Iran. E-mail: maemamieh@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Bu Ali-Sina University, Hamedan, Iran

Mites of the family Ereynetidae Oudemans, 1931 (Acari: Tydeoidea) consist of three subfamilies among which most members of the subfamily Ereynetinae are free living mites but members of the other two subfamilies are most parasitic mites on other animals such as snails, slugs, reptiles and birds. During a survey of mites in Kermanshah Province (western Iran), during 2011 and 2012, some specimens of mites of the family Ereynetidae was collected and identified as *Ereynetoides amplectorus* Hunter, 1964 living in soil under oak trees of Bisotoon region. This is the first record of this genus and species from Iran. The genus *Ereynetoides* was set up to include those *Ereynetes* which have lens like eyes on the propodosoma. Although reported from Asia, the Antarctic area, and North America, this genus is probably worldwide in distribution. The species, *E. amplectorus* has circular striations around the lens like eyes, delicate dorsal setae, and setae 've' slightly in front of the anterior sensory setae. The heavy pattern on the propodosomal shield consists of a curved posterior portion separated from the more elaborate anterior part. The knowledge of Iranian ereynetid mites is poor and unstudied and the current finding provides the second genus of these mites reported from Iran.

Key words: Prostigmata, Tydeoidea, Ereynetidae, *Ereynetoides amplectorus*, Iran.

Fauna of mesostigmatic mites (Acari: Mesostigmata) associated with the Mediterranean pine engraver beetle, *Orthotomicus erosus* (Wollaston) (Coleoptera: Curculionidae: Scolytinae) in Markazi Province, Iran

Vahid Reza FARMAHINY FARAHANI, Ali AHADIYAT and Mahmoud SHOJAEI
Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mails: vr.farmahiny@yahoo.com; ali.ahadiyat@hotmail.com and a.ahadiyat@srbiau.ac.ir

Coniferous trees play an important role in forming urban green spaces in Markazi Province. Bark beetles are considered as major pests for pine trees in this area, because they cause small holes all over the trunk. During the years 2012–13, the study on fauna of mesostigmatic mites associated with the Mediterranean pine engraver beetle, *Orthotomicus erosus* (Wollaston, 1857), was performed in Saveh and Mahallat regions. Four species of mites in four different families were identified as follows:
Ascidae: *Arctoseius cetratus* (Sellnick, 1940); Celaenopsidae: *Pleuronectocelaeno barbara* Athias-Henriot, 1959; Cercomegistidae: *Cercoleipus kuznetsovi* Khaustov, 1997; Digamasellidae: *Dendrolaelaps (Dendrolaelaps) quadrisetus* (Berlese, 1921)
This is the first record of the species, *D. (D.) quadrisetus* from Iran. This species had also been collected associated with this scolytid from Tehran Province in 2010, by the present authors. The species, *A. cetratus* and *C. kuznetsovi* were found only in Sāveh, but *D. (D.) quadrisetus* and *P. barbara* were found in both of the regions, Saveh and Mahallat. At least one unidentified species of Uropodina was collected from Saveh and Mahallat. Other mites collected from the bark beetle galleries included specimens from five families of the suborder Prostigmata and two families of the cohort Astigmatina were also collected. Their identification is now in progress.

Key words: mite, bark beetle gallery, pine, Markazi Province, Iran.

Identification of laelapid mites (Acari: Mesostigmata: Laelapidae) inhabiting in soil-litter and associated with ants' nests in some regions of Mashhad, Iran

Azadeh GHAFARIAN[1], Omid JOHARCHI[2], Mahdi JALAEIAN[3] and Alireza JALALIZAND[1]
1. Department of Entomology, Collage of Agriculture, Khorasgan Branch, Islamic Azad University, Isfahan, Iran. E-mail: ghafarian.azadeh@yahoo.com, arjalalizand@gmail.com; 2. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. E-mail: joharchi@iauyazd.ac.ir; 3. Department of Plant Protection, Rice Research Institute of Iran (RRII), Rasht, Iran. E-mail: mahdi_jalaeian@yahoo.com

This study is based on identification of Laelapidae mites inhabiting in soil-litter and associated with ants' nests in some regions of Mashhad, Iran which was carried out during 2011–2012. During this study, 24 species from 12 genera and three subfamilies were collected and identified. One of these species is new to science, and one species is considered as new records for the mites fauna of Iran which are marked by one and two asterisks, repectively.
Gaeolaelaps praesternalis (Willmann, 1949), *G. aculeifer* (Canestrini, 1884), *G. angusta* (Karg, 1962), *G. asperatus* (Costa, 1968), *G. kargi* (Costa, 1968), *G. queenslandicus* (Womersley, 1956), *G. sclerotarsus* (Costa, 1968), *G. minor* (Costa, 1968), *Euandrolaelaps karawaiewi* (Berlese, 1903), *E. sardoa* (Berlese, 1911), *Cosmolaelaps* sp. nov.*, *C. lutegiensis* (Shcherbak, 1971), *C. vacua* (Michael, 1891), *Reticulolaelaps faini*** (Costa, 1968), *Ololaelaps placentula* (Berlese, 1887), *Hypoaspis integer* (Berlese, 1911), *Pseudoparasitus missouriensis* (Ewing, 1909), *Haemolaelaps casalis* (Berlese, 1887), *Haemolaelaps* sp., *Laelaspisella canestrinii* (Berlese, 1903), *Gymnolaelaps*. sp., *G. myrmophila* (Michael, 1891), *Myrmozercon cyrusi* Ghafarian and Joharchi, 2013, *Laelaspis astronomicus* (Koch, 1839)

Key words: Laelapidae, soil, ants' nests, fauna, Mashhad.

Mite fauna of the superfamily Eriophyoidea (Acari: Prostigmata) associated with landscape plants and trees in Mashhad city, Iran

Maryam GHAREZARE [1], Hashem KAMALI [2] and Davood SHIRDEL [3]

1. Entomology Department, Tabriz Branch Islamic Azad University, Tabriz, Iran. E-mail: m.gharezade@yahoo.com; 2. Agricultural and Natural Resources Research Center of Khorasan Razavi, Mashhad, Iran; 3. Agricultural and Natural Resources Research Center, East Azarbayejan, Tabriz, Iran

Eriophyoid mites are one of the most important small arthropods on many plants. Most of them are specialized on their host plants. During 2011–2012, a faunistic study was conducted for collection and identification of eriophyoid mites on pine trees in Mashhad. A total of twenty species belonging to ten genera and three families were collected and identified. Among them, the five species are reported for the first time from Iran (*), 10 species for the first time from Mashhad (**), one new host plant species (***) and two species with new symptoms and losses on the host plant (****). List of identified species is as follows: 1. Eriophyidae: *Aceria anthocoptes* (Nalepa) **,*** on *Cirsiom arvense* L. (Asteraceae), *Aceria drabae* (Nalepa)** on *Cardaia draba* L. (Brassicaceae), *Aceria erineum* (Nalepa) and *Aceria tristriatus* (Nalepa) on *Juglans regia* L. (Juglandaceae), *Aceria fraxinivora* (Nalepa) on *Fraxinus excelsior* L. (Oleaceae), *Aceria mori* (Keifer)* on *Morus alba* L. (Moraceae), *Aculops paraglabri* (Keifer)** on *Acer glabrum* Torr. (Aceraceae), *Aculus solani* (Boczek & Davis)**, **** on *Solanum nigrum* L. (Solanaceae), *Cecidophyes hendersoni* (Keifer)** on *Yucca glauca* Nutt. (Liliaceae), *Colomerus vitis* (Pagenstecher) on *Vitis Vinifera* L. (Vitaceae), *Eriophyes emarginatae* (Keifer)** and *Eriophyes savagei* (Keifer)** on *Prunus illicifolia* L. (Rosaceae), *Notalus nerii* (Keifer)** on *Nerium oleander* L. (Aposcyanaceae), *Phyllocoptes pruni* (Soleiman & Abou-Awad) ** on *Prunus domostica* L. (Rosaceae), *Platyphytoptus sabiniana* (Keifer)* on *Pinus eldarica* Tenore. (Pinaceae), *Rhinotergum schestorici* (Petanuvic) **, *** on *Prunus cerasus* L. (Rosaceae), *Schevtchenkella ulmi* (Farkas) on *Ulmus procera* L. (Ulmaceae). 2. Diptilomiopidae: *Rhyncaphytaptis ficifoliae* (Keifer)** on *Ficus carica* L. (Moraceae). 3. Phytoptidae: *Trisetacus ehmnni* (Keifer) * and *Trisetacus pini* (Keifer)* on *Pinus eldarica* Tenore (Pinaceae).

Key words: Eriophyoidea, new records, Iran.

Species composition of Tetranychoidea (Acari: Trombidiformes: Prostigmata) in seven parks of Tehran, Iran

Sahebeh GHASEMI MOGHADAM[1], Alimorad SARAFRAZI[2], Edward A. UECKERMANN[3], Gilberto J. DE MORAES[4], Ali AHADIYAT[1] and Hasan RAHMANI[5]

1. Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mails: sahebe. moghadam@gmail.com, a.ahadiyat@srbiau.ac.ir, ali.ahadiyat@hotmail.com; 2. Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection, Evin, Tehran, Iran, E-mail: sarafrazi@iripp.ir; 3. ARC-Plant Protection Research Institute, Private bag X134, Queenswood, Pretoria, South Africa, E-mail: Ueckermanne@arc.agric.za; 4. Departamento de Entomologia e Acarologia, Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ), Universidade de São Paulo, 13418-900, Piracicaba, São Paulo, Brazil. E-mail: moraesg@usp.br; 5. Department of Plant Protection, Faculty of Agriculture, Zanjan University, Zanjan, Iran. E-mail: Rahmani_hsn@yahoo.com

Species composition of the superfamily Tetranychoidea of seven parks representing the two main climates of Tehran was compared by determining the number of species shared between the different (pairs of) sites and the number of species unique to each site. Mite specimens were collected from 17 host plant species. The following species were identified. Among them, one genus is new to the acarofauna of Iran which is marked by an asterisk.Tertranychidae: 1. *Eotetranychus* sp.; 2. *Eutetranychus* sp.; 3. *Eutetranychus africanus* (Tucker, 1926); 4. *Eutetranychus orientalis* (Klein, 1936); 5. *Mononychellus* sp.*; 6. *Panonychus ulmi* (Koch, 1836); 7. *Tetranychus* sp.; 8. *Tetranychus ludeni* Zacher, 1913; 9. *Tetranychus turkestani* (Ugarov & Nikolski, 1937); 10. *Tetranychus urticae* Koch, 1853. Tenuipalpidae: 1. *Cenopalpus meyerae* Khosrowshahi, 1991; 2. *Tenuipalpus euonymi* Khosrowshahi, 1991, 3. *Tenuipalpus granati* Sayed, 1946. The data analysis performed by SPSS ver. 20 showed that Golbon, Laleh and Qeytariyeh Parks had the highest rate of species (53.84%, 46.15% and 46.15%, respectively). The least number of species (15.38%) was observed in Chitgar Natural Park. Among the species, *C. meyerae, T. urticae*, *Tetranychus* sp. and *Eotetranychus* sp. were found in most of the parks. *Eutetranychus orientalis, E. africanus* and *Eutetranychus* sp. were only found in Golbon Park with mainly ornamental plants, and *Mononychellus* sp. occurred only in Laleh Park with vegetation dominated by fig species.

Key words: Species composition, Tetranychoidea, Parks, Tehran, Iran.

A new species record of oribatid mites (Acari: Oribatida) for the Iran mite fauna, from Heyran and Arasbaran regions, Iran

Saeide Sadat GHEBLEALIVAND, Karim HADDAD IRANI NEJAD and Ali AKBARI
Department of Plant Protection, Faculty of Agriculture, University of Tabriz, Tabriz, 5166616471, Iran. E-mail: khaddad@tabrizu.ac.ir

Oribatid mites are a large group of soil mites. They form an important part of detritus food webs, and most species feed on fungi and litter, and their role in decomposition of dead organic matter is significant. A faunistic study was conducted during 2011. Soil samples of Heyran and Arasbaran regions in northwest of Iran, were taken and transferred into the acarology laboratory, Faculty of Agriculture, university of Tabriz. Mites were extracted using a Berlese funnel, cleared in Nesbitt's fluid and were mounted on microscopic slides using Hoyer's medium. In this study, 13 families, 16 genera and 21 species were identified. Among them, one species is new record for the Iran mite fauna and is marked by an asterisk. List of species are as follows:
Camisiidae: *Heminothrus (Neonothrus) humicola** (Forssluund, 1955); Nothridae: *Nothrus biciliatus* Koch, 1841; Epilohmanniidae: *Epilohmannia cylindrica cylindrica* (Berlese, 1904); Phthiracaridae: *Phthiracarus lentnlus* (Koch, 1841); *Stegnacarus carinatus* (C.L. Koch, 1841); Euphthiracaridae: *Rhysotritia ardua* (Koch, 1841); Damaeidae: *Metabelba* Grandjean, 1936; Damaeolidae: *Fosseremus quadripertitus* (Berlese, 1905); Eremulidae: *Eremulus* sp. nr. *avenifer* Berlese, 1913; Tectocephidae: *Tectocephus velatus* Micheal (1880); *T. minor* Berlese, 1903; Oppiidae: *Anomaloppia iranica* Bayartogtokh & Akrami, 2000; *Ramusella (R.) puertomonttensis* Hammer, 1962; *Rhinoppia obsoleta* (Paoli, 1908); Oribatulidae: *Oribatula (Zygoribatula) connexa connexa* Berlese, 1904; *O. connexa ucrainica* (Iordansky, 1990); *O.* sp. nr. *skrjabini* (Bulanova-Zachvatkina, 1967); *O. (O.) tibialis allifera* Subías, 2000; *O. (O.) pallida* Banks, 1906; Scheloribatidae: *Scheloribates laevigatus* (Koch, 1835); Punctoribatidae: *Punctoribates* (*P.*) *liber (*Paultchenko, 1991); *P. (P.) paracapucinus* (Mahunka, 1988).

Key words: Cryptostigmata, East Azarbaijan Province, Camisiidae.

Selected problems of acarological research

Dariusz J. GWIAZDOWICZ
Poznan University of Life Sciences, Department of Forest Protection, Wojska Polskiego 71c, 60-615 Poznan, Poland. E-mail: dagwiazd@up.poznan.pl

To identify factors hindering development of any field of science is no doubt crucial. In acarological research such difficulties can be found in the area of ecology (e.g. problems caused by dynamic variability of environmental conditions determining occurrence of mites or by hard comparisons of obtained results), paleontology (difficulties in obtaining research material and low number of specialists), and taxonomy (poor description of species and difficult access to a type material). Such problems can also be attributed to geographical regions or climate zones. For example, in polar zone any research must face high costs and difficulties in obtaining samples, whereas in tropical forests the difficulty lies in enormous biodiversity, only partially known and described. Each scientific conference or a meeting of specialists gives an opportunity to discuss those issues and to find solutions through their future cooperation.

Key words: ecology, paleontology, taxonomy.

Some of edaphic mesostigmatic and prostigmatic mites in Southwest of East Azerbaijan Province, Iran

Zahra HASHEMI KHABIR, Karim HADDAD IRANI NEJAD and Ali AKBARI
Department of Plant Protection, faculty of Agriculture, University of Tabriz, Tabriz, Iran 5166616471. E-mail: khaddad@tabrizu.ac.ir

During 2011, faunistic survey of mesostigmatic and prostigmatic mites was carried out in southwest of East Azerbaijan Province. Soil samples were taken from different crop fields, transferred into the acarology laboratory of Tabriz University. Mites were extracted using Berlese funnel and were cleared in Nesbitt's fluid. Microscopic slides were prepared using Hoyers medium and finally identified. In this study, 7 families, 10 genera, 13 species of mesostigmatic mites and, 8 families, 11 genera, 14 species of prostigmatic mites were collected and identified. They are listed as follows:
Mesostigmata: Laelapidae: *Cosmolealaps vacua* Michael, 1891; *Gaeolaelaps aculeifer* (Canestrini, 1884); *Pseudoparasitus* sp.; Digamasellidae: *Dendrolaelaps brevipilis* Leitner, 1949; *Dendrolaelaps lobatus* Scherbak & Chelebier, 1977; Pachylaelapidae: *Pachylaelaps* (*Onchedellus*) *karawaiewi* Berlese, 1921; *Pachylaelaps pectinifer* (G. Canestrini & R. Canestrini, 1882); Ascidae: *Lasioseius youcefi* Athias-Henriot, 1959; *Gamasellodes bicolor* Berles,1918; Ameroseiidae: *Ameroseius corbiculus* Sowerby, 1806; Macrochelidae: *Macrocheles insignitus* Berlese, 1918; Rhodacaridae: *Rhodacarellus epiginialis* Sheals, 1956; *Rhodacarus* sp. Berlese, 1921.
Prostigmata: Scutacaridae: *Imparipes tataricus* Sevastianov, 1964; *Imparipes longisetosus* Willmann, 1951; *Scutacarus* (*Variatipes*) *eucomus* (Berlese, 1908); *Scutacarus* (*Scutacarus*) *shvicki* Lazauskene and Sevastiaov, 1974; Microdispidae: *Caesarodispus* sp.; Siteroptidae *Pediculaster mesembrinae* Canestrini, 1881; Neopygmephoridae *Pseudopygmephorus* sp.; Erythraeidae: *Erythraeus* (*Zaracarus*) *iranicus* Saboori & Akrami, 2001; Tetranychidae: *Tetranychus urticae* Koch, 1836; Stigmaeidae: *Stigmaeus unicus* Kuznetzov, 1977*; Eustigmaeus sculptus* Dugan, 2003; *Eustigmaeus nasrinae* Khanjani and Ueckermann, 2002; *Ledermuelleriopsis zahiri* Khanjani & Ueckermann*,* 2002*;* Ereynetidae: *Ereynetes sabinensis* Baker, 1945.

Key words: East Azerbaijan, Mesostigmata, mite fauna, Prostigmata, soil.

Sminthuridae Lubbock, 1862 (Insecta: Collembola) as new host for subfamily Erythraeinae (Acari: Erythraeidae)

Masoud HAKIMITABAR[1], Alireza SABOORI[2] and Ali SEDGHI[3]
1. College of Agriculture, Shahrood University of Technology, Shahrood, Iran. E-mail: hakimitabar@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir; 3. College of Agriculture, Payame noor University of Jahrom, Jahrom, Iran. Email: ali_sedghi_1143@yahoo.com

The subfamily Erythraeinae was established by Robineau-Desvoidy in 1828. The genera which have been defined from larval stage in this subfamily are as follows: 1. *Abalakeus* Southcott, 1994; 2. *Curteria* Southcott, 1961; 3. *Erythraeus* Latreille, 1806; 4. *Erythrites* Southcott, 1961; 5. *Erythroides* Southcott, 1946; 6. *Forania* Southcott, 1961; 7. *Lasioerythraeus* Welbourn & Young, 1987; 8. *Makolia* Saboori, Khaustov & Hakimitabar, 2009; 9. *Neophanolophus* Shiba, 1976; 10. *Paraphanolophus* Smiley, 1968; 11. *Proterythraeus* Vercammen-Grandjean, 1973; 12. *Rainbowia* Southcott, 1961; 13. *Ramsayella* Zhang, 2000; 14. *Taranakia* Southcott, 1988. All genera associated with Araneae and subclass Pterygota (Insecta) but only one species, *Erythrites* sp. near *womersleyi* (Southcott, 1946) has been reported as parasite of *Corynephoria quadrimaculata* Womersley, 1942 (Insecta: Apterygota: Collembola: Bourletiellidae). In 28 March 2009, one species of springtails, *Sminthurus viridis* (Linnaeus, 1758) (Collembola: Sminthuridae) was collected from Jahrom city, Fars Province. The springtails were transferred into the laboratory and five mites were found on five Collembola. Mites were detached from their mesonotum. Its genus is new to science and Sminturidae is a new host for erythraeine mites.

Key words: Erythraeinae, new host, new genus, Sminthuridae, Bourletiellidae.

Faunia of mites associated with ornamental plants in Tehran, Iran

Persila HAMIDI[1], Hadi OSTOVAN[2], Karim KAMALI[3] and Ali AHADIYAT[1]
1. Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mails: phamidi777@yahoo.com, ali.ahadiyat@hotmail.com & a.ahadiyat@srbiau.ac.ir; 2. Department of Entomology, Science and Research Branch, Islamic Azad University, Fars, Iran; 3. Emeritus Professor, Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran.

During a survey of soil- and plant-inhabiting mites associated with ornamental plants in different regions of Tehran, many mite specimens from different groups were collected from soil, plant litters, plant leaves and twigs, using Berlese-Tullgren funnel and beating sheet. After clearing them in lactophenol, specimens were mounted in Hoyer's medium, and finally identified. Totally, 33 species, belonging to 30 genera, 23 families, and 3 orders were determined as follows. Among them two and one species, which are marked by one and two asterisks respectively, are considered as new records from Iran and new species for the science.
I) Mesostigmata: Dinychidae: *Uroobovella obovata* (G. Canestrini & Berlese, 1884); Eviphididae: *Alliphis halleri* (G. & R. Canestrini, 1884), *Evimirus uropodinus* (Berlese, 1903); Laelapidae: *Gaeolaelaps aculeifer* (G. Canestrini, 1884), *Haemolaelaps casalis* (Berlese, 1887); Macrochelidae: *Glyptholaspis americana* (Berlese, 1888), *Holostaspella ornata* (Berlese, 1904), *Macrocheles robustulus* (Berlese, 1905); Parasitidae: *Parasitus hyalinus* (Willmann, 1949), *Parasitus* sp.; Parholaspididae: *Gamasholaspis gamasoides* Berlese, 1904*, *Holaspina alstoni* (Evans, 1956); Phytoseiidae: *Typhlodromus* (*Anthoseius*) *bagdasarjani* Wainstein & Arutunjan, 1967; Rhodacaridae: *Multidentorhodacarus sogdianus* (Shcherbak, 1980)*, *Rhodacarellus silesiacus* Willmann, 1936; Trematuridae: *Nenteria stylifera* (Berlese, 1904), *Nenteria* sp. II) Trombidiformes: Prostigmata: Cheyletidae: *Cheyletus malayensis* Cunliffe, 1962; Pygmephoridae: *Pediculaster* sp.; Tetranychidae: *Tetranychus urticae* Koch, 1853. III) Sarcoptiformes: Oribatida: Astigmatina: Acaridae: *Sancassania mycophagus* (Mégnin, 1874), *Tyrophagus putrescentiae* (Schrank, 1781), *T. similis* Volgin, 1949; Echimyopodidae: *Blomia freemani* Hughes, 1948; Glycyphagidae: *Glycyphagus domesticus* (De Geer, 1778); Histiostomatidae: *Histiostoma feroniarum* (Dufour, 1839). Oribatida: Excluding Astigmatina: Euphthiracaridae: *Rhysotritia ardua* (Koch, 1841); Galumnidae: *Trichogalumna* sp. nov.**; Oribatulidae: *Zygoribatula undulata* (Berlese, 1916); Nothridae: *Nothrus biciliatus* Koch, 1841; Tectocepheidae: *Tectocepheus velatus* (Michael, 1880); Xenillidae: *Xenillus* cf. *ybarrai* Morell, 1987; Xylobatidae: *Brasilobates* cf. *bipilis* Pérez-Iñigo & Baggio, 1980.

Key words: mite, ornamental plants, Tehran.

The edaphic mites of the Phytoseiidae family from orchards of Lorestan Province

Iman HASANVAND[1], Mojtaba RAHMATI[2] and Shahriar JAFARI[1]
1. Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: imanhassanvand@gmail.com; 2. Department of Plant Protection, Aboureihan campus, University of Tehran, Tehran, Iran.

Phytoseiid mites have been studied extensively with regard to their potential for the biological control of phytophagous arthropods on different plants. These mites are one of the important natural enemies of plant-feeding arthropods, such as spider and eriophyid mites and other small insects. All of these mites are predator and may live on foliage or in other places such as soil. A survey for determination the species diversity of the phytoseiid mites in soil and plant debris of orchards in Lorestan Province was conducted during 2012. The mites were extracted by a Berlese-Tullgren funnel. The specimens were cleared in Nesbitt's fluid and mounted in Hoyer's medium on microscope slides. A total number of seven species belonging to two genera from subfamily Amblyseiinae were collected and identified. The list of collected species is as follows: *Euseius scutalis* (Athias-Henriot) (collected in soil of fig trees), *Neoseiulus marginatus* (Wainstein) (collected in soil of pomegranate orchards), *N. bicaudus* (Wainstein) (collected in soil of apple orchards), *N. barkeri* Hughes (collected in soil of apricot, walnut and oak orchards), *N. sugonjaevi* (Wainstein and Abbasova) (collected in soil of apple and peach orchards), *N. zwoelferi* (Dosse) (collected in soil of apple and walnut orchards) and *N. cucumeris* (Oudemans) (collected in soil of pomegranate orchards in Agricultural faculty of Lorestan University). The species, *N. cucumeris* is recorded for the first time from Lorestan Province.

Key words: edaphic mites, Phytoseiidae, orchards, Lorestan Province

Faunistic study the family Laelapidae (Acari: Mesostigmata) in Lorestan Province, Iran

Hadi HEYDARI[1], Shahriar JAFARI[1], Omid JOHARCHI[2] and Jahanshir SHAKARAMI[1]
1. Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: hadiheidary1366@gmail.com; 2. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. E-mail: j.omid2000@gmail.com; joharchi@iauyazd.ac.ir

The mite family Laelapidae is a large family with worldwide distribution. Many of them are ectoparasitic on small mammals or associated with arthropods. Other species are free-living predators that inhabit soil-litter habitats, while some others are commonly found in stored products. This study is based on a survey of soil-inhabiting Laelapidae which was carried out during spring and summer in 2012 in Lorestan Province, Iran. During this study, 16 species belonging to four genera and two subfamilies were collected and indentified. One species is new to science (marked **) and will be described in a separate paper. All the identified species are considered as new records for the mite fauna of Lorestan Province. The lists of collected mites are as follows:
A. Subfamily: Hypoaspidinae: *Gaeolaelaps aculeifer* (Canestrini, 1884), *Gaeolaelaps asperatus* (Costa, 1968), *Gaeolaelaps angusta* (Karg, 1962), *Gaeolaelaps praesternalis* (Willmann, 1949), *Gaeolaelaps minor* (Costa, 1968), *Gaeolaelaps nolli* (Karg, 1962), *Gaeolaelaps* sp., *Gaeolaelaps kargi* (Costa, 1968), *Gaeolaelaps* sp. nov.**, *Gaeolaelaps queenslandicus* (Womersley, 1956), *Euandrolaelaps karawaiewi* (Berlese, 1903), *Cosmolaelaps lutegiensis* (Shcherbak, 1971), *Cosmolaelaps vacua* (Michael, 1891); B. Subfamily: Laelapinae: *Haemolaelaps shealsi* (Costa, 1968), *Haemolaelaps* sp., *Haemolaelaps casalis* (Berlese, 1887)

Key words: Fauna, soil, Laelapidae, Lorestan Province, Iran.

First record of the *Premicrodispus akermanae* (Sevastianov & Al Douri, 1988) (Acari: Microdispidae) from Iran

Farahnaz HOSSEINI NAVEH, Hamidreza HAJIQANBAR and Ali Asghar TALEBI
Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran. E-mail: hosseininavehfarahnaz@yahoo.com

The family Microdispidae (Acari: Heterostigmatina) consists of fungivorous mites that sometimes are found on different arthropods, including insects. During a survey of phoretic mites associated with insects in forests of Golestan Province (northern Iran), one species of the microdispid mites found under elytra of a scarabaeid beetle. The mite species identified as *Premicrodispus akermanae* (Sevastianov & Al Douri, 1988). This species is new for arthropod fauna of Iran. The mentioned species was previously collected from soil samples in Ukraine and so, this is first record of a phoretic relationship between mites of this species and insects (Coleoptera: Scarabaeidae). Some distinguishing characteristics of *P. akermanae* are absence of setae 4*a*, presence of apodemes at bases of setae *e* and, presence of setae ps_2 and h_2 distinctly shorter than setae h_1.

Key words: Acari, Microdispidae, *Premicrodispus*, new record, Scarabaeidae, Iran.

First record of the family Labidostomatidae (Acari: Prostigmata) from Khorasan Razavi Province, Iran

Mahdi JALAEIAN[1], Hashem KAMALI[2] and Michel BERTRAND[3]
1. Department of Plant Protection, Rice Research Institute of Iran, Rasht, Iran. E-mail: mahdi_jalaeian@yahoo.com; 2. Department of Plant Protection, Agriculture & Natural Resources Research Center of Khorasan Razavi Province, Mashhad, Iran; 3. UMR 5175 CNRS CEFE Université Montpellier III, Route de Mende, F-34199 Montpellier Cedex5, France.

The family Labidostomatidae Oudemans, 1904 is the only one assigned to the supercohort Labidostomatides and superfamily Labidostomatoidea. This cosmopolitan family comprises medium-sized or large armored raptorial mites, mostly yellow, brown or orange. Labidostomids share a typical general appearance that helps in identification: a large shield covers the dorsum, with the integument sculptured, and usually with at least one pair of lateral lens like organ close to the lateral eyes. The chelicerae are large and chelate-dentate; the first legs are long. The genital and anal openings are conjoined in females, whereas these are apart from, yet close to each other in males. Two pairs of prodorsal trichobothria are present. The species live typically in the upper layers of soils (leaf litter, moss, etc.) but some species were collected in caves or deep soils in caves. Fertilization occurs via spermatophores. Larvae are inactive and non-feeding. Three active nymphal stages are present. Labidostomatids are predators of microarthropods. The occurrence of the family in Iran was first reported in 2012 from Golestan Province (Gorgan), North East of Iran. During 2005–2007, a faunistic survey was conducted on the soil-inhabiting mites in orchards of Khorasan Razavi Province, samples of the family Labidostomatidae were collected and identified as *Labidostoma* (*Labidostoma*) *intermedia* Bertrand *et al*., 2012. In the subgenus, *L.* (*L.*) *intermedia* is characterized by four main differences, from previously described species, in terms of cheliceral morphology, the length of leg I articles, the number of post epimeral pores and the characters of the infracapitulum. It is the second record of this rare family from Iran and the first record from Khorasan Razavi Province.

Key words: fauna, record, orchards, Labidostomatidae, Khorasan Razavi Province.

New records of the superfamily Rhodacaroidea (Acari: Mesostigmata) from Khorasan Razavi Province with report of a new genus for Iranian mite fauna

Mahdi JALAEIAN[1]; Raphael C. CASTILHO[2] and Gilberto J. de MORAES[2]
1. Department of Plant Protection, Rice Research Institute of Iran, Rasht, Iran. E-mail: mahdi_jalaeian@yahoo.com; 2. FAPESP/ Departamento de Entomologia e Acarologia, ESALQ-Universidade de São Paulo, Piracicaba, São Paulo, Brazil.

The Rhodacaroidea (Mesostigmata) is comprised of five families, Digamasellidae, Laelaptonyssidae, Ologamasidae, Rhodacaridae and Teranyssidae. The main morphological characteristic for inclusion of mites in the Rhodacaroidea is the insertion of seta *st*4 on the sternal shield. This superfamily consists of a widespread mite group in the soil and in accumulations of decaying organic matter. These mites are commonly predators of nematodes, small insects, mites and springtails, and at least one species appears to have potential as a biological control agent against insect and mite pests in the soil. During a survey carried out in orchards of Khorasan Razavi Province in 2005–2010, species belonging to five genera of Rhodacaroidea were collected and identified. All of them are new records for the fauna of Khorasan Razavi Province. Three species are new to science and their descriptions are in progress. Also, this is the first report of genus *Oligodentatus* Shcherbak, 1980 from Iran. The species collected are as follows:
Digamasellidae: *Dendrolaelaps* sp. nov., *Oligodentatus* sp. nov.; Rhodacaridae: *Multidentorhodacarus saboorii* Castilho, Jalaeian & Moraes, 2012, *Rhodacarellus iraniensis* Castilho, Jalaeian & Moraes, 2012, *Rhodacarus* sp. nov.

Key words: fauna, record, orchards, Digamasellidae, Rhodacaridae, Iran.

Present status of gall mites (Acari: Prostigmata: Eriophyoidea) on Almond trees in Khorasan Razavi Province (North East of Iran)

Hashem KAMALI[1] and Mahdi JALAEIAN[2]

1.Agricultural and Natural Resources Research Center of Khorasan Razavi, P.O.Box 91735-488, Mashhad, Iran. E-mail: hashemkamali@gmail.com; 2. Department of Plant Protection, Rice Research Institute of Iran, P.O.Box 1658, Rasht, Iran. mahdi_jalaeian@yahoo.com

Iran is the third largest producer of almonds after America and Spain and 6.4% of the world's fertile almond are in Iran. Almond rootstocks mainly are GF677 and GN. *Prunus dulcis* (Rosaceae) planting area insists on more than 48,000 hectares in Razavi Khorasan Province (North East). Kashmar and Torbat-e-heydarie counties have the highest level of almond planting area in the Province. Eriophyoid gall mites are one of the pests of almond trees and a study was conducted on them from 2010 to 2012. Samples of leaves, buds, flowers and nuts were collected from different regions of the Province. The mites were mounted in a drop of Hoyer's medium and were kept at 45–55°C for 10–12 hours. The cleared and dried specimen-slides were examined using a Leica DM1000 phase contrast compound microscope equipped with a drawing tube. Eight species were identified belonging to six genera and two families. In addition, some further collection and identification were carried out from other stone fruit trees. *Acalitus phloeocoptes* (Nalepa, 1890) caused a severe decrease in buds and flowers on infested branches showing galls around buds. *Aculus fockeui* (Nalepa & Trouessart, 1891) caused silver spots on leaves and reduced the amount of chlorophyll and crop yield. *Eriophyes savagei* Keifer, 1939 caused erineum on both sides of leaves, *Eriophyes emarginatae* Keifer, 1939 caused finger galls on leaf surface, *Eriophyes armeniaca* Bagdasarian, 1970 produced small galls near to buds. *Diptacus prunorum* (Keifer), 1939, *Rhinotergum schestovici* Petanovic, 1988 and *Phyllocoptes granati* Keifer, 1959 were found vagrant and no symptoms were observed on almond trees. Differentiation and identification keys were provided for Khorasan Razavi Province.

Key words: gall mite, almond, species, Khorasan Razavi Province, Iran.

First report of the family Asternoseiidae (Acari: Mesostigmata: Trigynaspida) from Iran

Shahrooz KAZEMI[1] and Saeid PAKTINAT SAEEJ[2]

1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: shahroozkazemi@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran

The family Asternoseiidae belongs to the superfamily Cercomegistoidea (Trigynaspida, Cercomegistina). Valle (1954) erected the family Asternoseiidae to accommodate the genus *Asternoseius* Berlese, 1910. Some of diagnostic features of the family are as follows: anterior sternal region desclerotized, fragmented, st1 in soft or lightly sclerotized cuticle; anal opening in large ventrianal shield; legs IV normal, not hypertrophied; peritrematal shields without longitudinal groove behind coxae IV. During an investigation on edaphic mesostigmatic mites in Amol region (Mazandaran Province, North of Iran) in 2012, female and nymph specimens of the family were extracted from soil and forest litter using a Berlese-Tullgren funnel, cleared in lactophenol and mounted in Hoyer's medium by junior author, and then identified as a new species of the genus *Asternoseius* by senior author. The genus *Asternoseius* includes two described species until now: *A. ciliates* Berlese, 1910 and *A. sculptus* Costa, 1962 and the new species differs from the latter species by several characters like shape and number of dorsal and ventral shield setae. This is the first report of the trigynaspid mites of family Asternoseiidae from Iran.

Key words: Acari, Trigynaspida, Asternoseiidae, *Asternoseius*, Iran.

First report of the genus *Pelethiphis* Berlese (Acari: Mesostigmata: Eviphididae) from Iran

Shahrooz KAZEMI[1], Esmaeil BABAEIAN[2] and Shima YAZDANPANAH[3]
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: shahroozkazemi@yahoo.com; 2. Department of Plant Protection, faculty of Agriculture, University of Tehran, Karaj, Iran; 3. Department of Entomology, Science and Research Branch, Islamic Azad University, Marvdasht, Iran

Predatory mesostigmatic mites of the family Eviphididae includes about 130 species and 19 genera. They are cosmopolitan mites that occur in soil, litter, and decomposing organic materials like vertebrate dung, carrion and nest of birds and mammals. Many species are phoretic on arthropods associated with these substrates, especially scarab and burying beetles. Members of the genus *Pelethiphis* Berlese, 1911 can distinguished from other genera of the family by several features like dorsal shield usually bears 30 pairs of heterogeneous setae in length, length of some of them are usually more than 10 times longer than others, with a long median process of gnathotectum with sharply sloping lateral base, palp tarsus with 2-tined apotel and only one sickle-shape setae, peritrematal shields not developed behind level of coxae IV, sternal shield well developed. Some specimens of the genus *Pelethiphis* were collected in South Iran in Fars and Khuzestan Provinces, of which one species, *P. opucus* Koyumdjieva, 1981, removed from *Copris* sp. in Ahvaz County, Khuzestan Province by the second author (EB) and another species of the genus was extracted from soil and litter in Koohmare-Sorkhi region, Fars Province by the third author (SHY) which identified at the genus level. This is the first report of the genus *Pelethiphis* from Iran.

Key words: Acari, Mesostigmata, Eviphididae, *Pelethiphis opucus*, Iran.

Some mesostigmatic mites (Acari: Mesostigmata) from Asaluyeh and Lengeh Ports, South Iran

Shahrooz KAZEMI[1] and Mahmoud ALIKHANI[2]
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: shahroozkazemi@yahoo.com; 2. Department of Entomology, Faculty of Agriculture, Islamic Azad University, Arak, Iran.

The Mesostigmata is a large, cosmopolitan assemblage of mostly free-living predatory mites that include an unusually diverse variety of lifestyle and habitats. So far, about 350 species belonging to almost 130 genera and 39 families have been reported from Iran of which few species recorded from Hormozgan and Bushehr Provinces, South Iran. Asaluyeh Port (Bushehr Province) and Lengeh Port (Hormozgan Province) are located on the shore of the Persian Gulf. Some mesostigmatic species were collected in a faunistic study on edaphic Mesostigmata in Asaluyeh and Lengeh Ports by junior author from soil. Mites were extracted using Berlese funnel, cleared in lactophenol and mounted in Hoyer's medium, then identified by senior author. These mites belong to four genera of four families, namely: Digamasellidae, Laelapidae, Ascidae and Urodinychidae of which one species, *Dendrolaelaps* cf. *willmanni* Hirschmann, 1960, is considered here as new record for Iran mite fauna that was collected in Asaluyeh Port [24 Jan 2009]. Also, *Gaeolaelaps minor* (Costa, 1968) [5 Sept 2008], *Arctoseius cetratus* (Sellnick, 1940) [24 Jan 2009], and *Uroobovella* n. sp. [6 Sept 2008] were collected from soil in Lenge Port that all species are reported here for the first time from Bushehr and Hormozgan Provinces of which *Gaeolaelaps minor* has been reported from five and *Arctoseius cetratus* from 14 Provinces of Iran before, and the urodinychid species of the genus *Uroobovella* is new for science.

Key words: Acari, Mesostigmata, Asaluyeh, Lengeh, *Dendrolaelaps willmanni*, Iran

Mites of the family Laelapidae (Acari: Mesostigmata) in Alborz Province, Iran

Maryam KESHAVARZ JAMSHIDIAN and Esmaeil BABAEIAN
Department of Plant Protection, faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: mkjamshidian@gmail.com

In a survey which was conducted to collect some edaphic mites in various parts of Alborz Province in 2012, 14 species in seven genera of the family Laelapidae were collected and identified. Species are listed as follows:
Gaeolaelaps aculeifer (G. Canestrini, 1884), *G. queenslandicus* (Womersley, 1956), *G. nolli* (Karg, 1962), *G. kargi* (Costa, 1968), *Cosmolaelaps claviger* (Berlese, 1883), *C. lutegiensis* (Shcherbak, 1971), *C. vacua* (Michael, 1891), *Haemolaelaps casalis* (Berlese, 1887), *Gymnolaelaps myrmophila* (Michael, 1891), *G. messor* Joharchi, Halliday, Saboori & Kamali, 2011, *Pneumolaelaps sclerotarsus* (Costa, 1968), *Pseudoparasitus dentatus* (Halbert, 1920), *P. missouriensis* (Ewing, 1909), *Euandrolaelaps karawaiewi* (Berlese, 1903).

Key words: mite, Laelapidae, soil, Iran.

First record of *Protogamasellus bifurcalis* (Acari: Ascidae) from Iran

Narjes KHADEMI[1], Alireza SABOORI [2]
1. Department of Agricultural Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran. E-mail: narjes_khademi@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir

The family Ascidae comprises more than 22 genera and 340 predatory and microphytophagous species distributed around the world. Ascid mites live in soil, leaf litter, and subcortical situations and are often associated with other animals. These mites are mostly predators, but also can feed on fungal mycelium, and some are parasites. Mites of the genus *Protogamasellus* seem to have a world-wide distribution. They are known to occur in European soils. This genus was first described by Karg in 1962, with *P. primitivus* as the type species. Dorsum in the species of *Protogamasellus bifurcalis* Genis, Loots & Ryke, 1966 is very similar to the *P. primitivus*, but characters of the gnathosoma and body venter distinguish it from other known species of *Protogamasellus*. This species reported and described by Genis *et al.* (1966) from South Africa and Angola. *Protogamasellus bifurcalis* collected from soil of citrus orchards in Jahrom region on 14 June 2005. The mites were extracted by a Berlese-Tullgren funnel. They were cleared in lactophenol solution and were mounted in Hoyer's medium on microscopic slides. There is not enough information about the biology and behavior of this species. Record of this species is new to the mite fauna of Iran.

Key words: first record, *Protogamasellus bifurcalis*, soil, Mesostigmata.

Sarcoptiformes mites associated with stored food products in Mashhad, Iran

Zohreh KHALEGHABADIAN [1], Hussein SADEGHI NAMAGHI[1], Fariba ARDESHIR[2], Mohammad Ali AKRAMI[3], Saeed PAKTINAT SAEEJ[4] and Saeed HATEFI[1]

1. Department of Plant Protection, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran. E-mail: z.khaleghabadian@gmail.com; 2. Department of Zoology, Iranian Research Institute of Plant Protection, Tehran, Iran; 3. Department of Plant Protection, Faculty of Agriculture, Shiraz University, Shiraz, Iran; 4. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran.

The occurrence and activity of mites on stored foods causes significant qualitative and quantitative damages, reduction in germination power of the grains, and inducing bronchial asthma and dermal allergy to man. During 2011–2012 a survey was conducted to identify the mites associated with stored food products in North East region of Iran. Different varieties of food storages in the area were visited and sampled. Storage mites were extracted using a Berlese funnel. After clearing, using the Hoyer's medium, mite specimens were mounted as permanent microscope slides. As a result, a total of 22 genera from 15 families were collected which 20 of them were identified at species level and seven mite specimens determined only at genus level. The new records for fauna of the region are marked by an asterisk. The list of identified species is as follows: Astigmatina- Acaridae: *Aleuroglyphus ovatus* Troupeau, 1879*, *Caloglyphus berlesie* Michael, 1903, *Acarus siro* Linnaeus, 1758, *Rhizoglyphus echinopus* Fumouze & Robin, 1868, *Rhizoglyphus robini* Clapared, 1869, *Tyrophagus longior* Gervais, 1844 *Tyrophagus putrescentiae* Schrank, 1781. Chortoglyphidae: *Chortoglyphus arcuatus* Troupeau, 1879, Glycyphagidae: *Lepidoglyphus destructor* Schrank; 1781, Histiostomatidae: *Anoetus* sp., *Histiostoma feroniarum* Dufour, 1839, Suidasiidae: *Suidasia nesbitti* Hughes, 1948; Oribatida- Aphelacaridae: *Aphelacarus acarinus* Berlese, 1910*, Cosmochthoniidae: *Cosmochthonius* sp.*, *Phyllozetes emmae* Berlese, 1910*, Ctenacaridae: *Ctenacarus araneola* Grandjean, 1932*, Euphthiracaridae: *Acrotriria* (=*Rhysotritia*) *ardua* Koch, 1841*, Galumnidae: *Galumna discifera* Balogh, 1960*, *Galumna karajica* Mahunka & Akrami, 2001*, Haplozetidae: *Haplozetes* sp.*, Mesoplophoridae: *Mesoplophora* sp.*, Opiidae: *Lasiobelba* sp.*, Oribatulidae: *Oribatula* (*Oribatula*) sp.*, *Oribatula* (*Zygoribatula*) sp.*, *Oribatula* (*Zygoribatula*) *connexa* Berlese, 1904*, *Oribatula* (*Zygoribatula*) *exarata* Berlese, 1916*, Scheloribatidae: *Scheloribates fimbriatus* Thor, 1930*.

Key words: fauna, storage mites, Astigmatina, Oribatida, North East of Iran.

Fauna of predatory mites associated with stored food mites in the North East of Iran

Zohreh KHALEGHABADIAN [1], Hossein SADEGHI NAMAGHI[1], Fariba ARDESHIR[2], Alireza NEMATI[3] and Saeed HATEFI[1]

1. Department of Plant Protection, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran. E-mail: z.khaleghabadian@gmail.com; 2. Department of Zoology, Iranian Research Institute of Plant Protection, Tehran, Iran; 3. Department of Plant Protection, Faculty of Agriculture, University of Shahrekord, Shahrekord, Iran.

During 2011 and 2012, to identify the mites associated with stored food products in North East region of Iran, different food storages in the area were visited and sampled. Storage mites were extracted using a Berlese funnel. Mite specimens were cleared in Nesbitt's fluid. After clearing, mite specimens were mounted as permanent microscopic slides using Hoyer's medium. In this study, a total of 21 species, 15 genera belonging to 11 families including Mesostigmata and Trombidiformes have been identified so far. Among the identified species, those marked with one and two stars are new records for the studied area and Iran, respectively. The list of identified species is as follows: Trombidiformes- Bdellidae: *Spinibdella cronini* Baker & Balock, 1944, *Spinibdella* sp.**, Cheyletidae: *Cheyletus trouessarti* Oudemans, 1903*, *Lepidocheyla gracilis* Volgin, 1969*, *Neoucheyla iranica* Fain & Ardeshir, 2000*. Cunaxidae: *Cunaxa capreolus* Berlese*, *Cunaxa setirostris* Hermann, 1804. Caligonellidae: *Molothrognathus mehrnejadi* Liang & Zhang, 1997*, *Paraneognathus oblongus* (Soliman, 1971)*. Raphignathidae: *Raphignathus hecmatanaensis* Khanjani & Ueckermann, 2003*, *Raphignathus gracilis* Rack, 1962, Stigmaeidae: *Stigmaeus elongates* Berlese, 1886, *Storchia robustus* Oudemans, 1923*. Mesostigmata- Ameroseiidae: *Ameroseius pavidus* Koch, 1839*, *Ameroseius delicatus* Berlese, 1918**. Ascidae: *Arctoseius cetratus* Sellnick, 1940*, *Arctoseius* sp., Laelapidae: *Haemolaelaps fenilis* Megnin, 1875*, *H. casalis* Berlese, 1887*. Macrochelidae: *Macrocheles muscaedomesticae* (Scopoli, 1772)*, *Macrocheles merdarius* (Berlese, 1889). Mellicaridae: *Proctolaelaps ventrianalis* Karg, 1971*, *P. pygmaeus* (Müller, 1860)*.

Key words: Prostigmata, Mesostigmata, stored food mites, Predatory mites, Iran.

A report of a new host of predatory mite, *Cheletogenes ornatus,* on armored scale *Mercetaspis halli,* in Chaharmahal and Bakhtiari Province (Iran) on fruit trees

Najmeh KIANPOUR[1], Sayed Habibollah NOURBAKHSH[2], Bijan HATAMI[1], Masumeh MOGHADDAM[3] and Masoud HAKIMITABAR[4]

1. Departement of Agriculture, Islamic Azad University, Khorasgan Branch, Khorasgan, Isfahan, Iran, Postal code: 8155139999. E-mail: Kianpoor_n@yahoo.com; 2. Departement of Plant Protection, Agricultural and Natural Resources Research Center, Chaharmahal and Bakhtiari Province, Iran. 3. Iranian Research Institute of Plant Protection, Tehran, Iran. 4. Department of Horticulture and Plant Protection, Collage of Agriculture, University of Shahrood, Shahrood, Iran.

One of the most important pests of orchards that need serious attention are scale insects. The members of the family Diaspididae are commonly called as armored scale insects. The armored scales constitute one of the most successful groups of plant-parasitic arthropods and include some of the most damaging and refractory pests of perennial crops and ornamentals. The members of this family are among the most important pests in agriculture and considered as a promising target for the biological control programs. *Mercetaspis halli* (Green) (Hemiptera: Diaspididae) is a polyphagous armored scale which feed on different species of family Rosaceae especially peach and almond. This pest has several predators and parasites in Acari and insect. Biological studies on armored scale *M. halli* on orchards in Chaharmahal and Bakhtiari Province showed that *Cheletogenes ornatus* (Canestrini and Fanzago, 1876) (Trombidiformes: Cheyletidae) is one of the important predatory mites of *M. halli*. This predatory mite exists on cracks of trunks and branches of peach, almond and plum trees for all year round. *Cheletogenes ornatus* perforates the buckler of *M. halli* by its chelicers and feeds on the armored scales body. More investigations on the efficiency of *C. ornatus* could be useful to control management of armored scale, *M. halli.*

Key words: armored scale, predator, peach, almond, plum.

Gonocephalum pubiferum Reitter, 1904 (Col.: Tenebrionidae), a new host record for *Heterodispus turkmenistanensis* Khaustov and Chydyrov, 2005 (Acari: Heterostigmatina: Scutacaridae)

Amir LOGHMANI, Hamidreza HAJIQANBAR and Ali Asghar TALEBI

Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran. E-mail: amirloghmani@yahoo.com

Mites of the family Scutacaridae are fungivorous and usually dispersed by making phoretic relationships with various insects. During an investigation, carried out in July 2012, an overnight sampling was performed in the Saxaul (*Haloxylon*) forests around the Hokmabad city (near Sabzevar, Razavi Khorasan Province) and *Heterodispus turkmenistanensis* Khaustov and Chydyrov, 2005 (Heterostigmatina: Scutacaridae) was obtained associated with *Gonocephalum pubiferum* Reitter, 1904 (Col.: Tenebrionidae). Previously, the mite was collected in soil of cucumber fields, in Turkmenistan. After that, the *H. turkmenistanensis* was found associated with *Scarites* (*Scarites*) *procerus eurytus* Fischer von Waldheim, 1828 (Col.: Carabidae) from Kerman Province, Iran. This is first record of the phoretic association between *H. turkmenistanensis* and the family Tenebrionidae.

Key words: Heterostigmatina, Scutacaridae, Phoresy, New record, Tenebrionidae, Iran.

A comparative study of the chaetotaxy and structure of tarsus I in Mesostigmata mites (Acari: Parasitiformes): developing a system to notate the tarsal setae

Maria LORDES MORAZA

Department of Zoology and Ecology, Faculty of Science, University of Navarra, Pamplona 31080, Spain. E-mail: mlmoraza@ unav.es

A comparative and ontogenetic study of the setae present on the surface of tarsus I on 23 families representing the three suborders and six cohorts of Mesostigmata miteshas permitted the identification and homologation of 54 setae. The setae are arranged in four verticils (V1-V4) which fully complete during ontogeny: 34 setae appear at the larval instar, 12 at the protonymph and eight appear at the deutonymph instar. Verticils 1, 2 and 3 constitute the Receptor Complex with high density of sensorial setae with tactile and/or chemosensory (gustatory, olfactory), thermo- and hygrosensory function, and verticil 4 is constituted by solid and usually ornate setae. Tarsal chaetome shows a numerical and probably functional bilateral symmetry. The setae may change shape, position and even function during ontogeny in order to maintain this symmetry. Tarsus I retains the basic primitive larval complement of setae present on tarsus II-IV, adding a completed acrotarsal verticil and other larval and post larval setae on the basal telotarsal verticils.

A diagrammatic representation of the completed general tarsal chaetome illustrates the topographic position of these setae on the tarsal surface and a system for naming these setae is proposed.

Key words: ontogenetic study, function, acrotarsal verticil, telotarsal verticils.

Three eriophyid species (Acari: Trombidiformes: Eriophyoidea) from walnut trees, *Juglans regia* L. (Juglandaceae) new for Iran

Parisa LOTFOLLAHI[1], Karim HADDAD IRANI-NEJAD[1], Mohammad KHANJANI[2] and Enrico DE LILLO[3]

1. Department of Plant Protection, College of Agriculture, University of Tabriz, Tabriz, Iran, postal code: 5166616471. E-mail: prslotfollahy@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, Bu-Ali Sina University, Hamadan; 3. Department of Soil Sciences, Plant and Food, University of Bari Aldo Moro, Bari, Italy.

During a survey for Eriophyid mites (Trombidiformes: Eriophyoidea: Eriophyidae) associated with walnut, *Juglans regia* L. (Juglandaceae), in Azarshahr and Osku regions in early August, 2011, *Aceria tristriata* (Nalepa, 1890), *Aculops unguiculatus* (Nalepa, 1897) and *Shevtchenkella juglandis* (Keifer, 1951) were identified in Amir Dizaj village (Azarshahr). The latter two species is new for the mite fauna of Iran. *Anthocoptes striatus* Ponomareva, 1978 was collected either in Kandovan village (Osku) or in Azarshahr. This species is new record for the mite fauna of Iran, too. Careful considerations and comparisons were carried out on *Aculops unguiculatus* and *Anthocoptes striatus* males and females with the previous descriptions of five species which were in part misidentified for their deutogynes and protogynes.

Key words: Azarshahr, Eriophyidae, Iran, Kandovan, walnut.

One new species and four new records of Eriophyid mites (Acari: Trombidiformes: Eriophyidae) of landscaping trees in Iran

Parisa LOTFOLLAHI[1], Karim HADDAD IRANI-NEJAD[1], Mohammad KHANJANI[2] and Enrico DE LILLO[3]

1. Department of Plant Protection, College of Agriculture, University of Tabriz, Tabriz, Iran, postal code: 5166616471. E-mail: prslotfollahy@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Bu-Ali Sina, Hamadan; 3. Department of Soil Sciences, Plant and Food, University of Bari Aldo Moro, Bari, Italy.

In order to study the eriophyid mites (Trombidiformes: Eriophyidae) of landscaping trees in the southwest of East Azerbaijan Province, samples were taken during 2011. In this study, one new species for the science and four new records for Iranian eriophyoid fauna were identified as follows: *Anthocoptes salicis* (Nalepa, 1894) and *Stenacis palomaris* (Keifer, 1970) from *Salix alba* L. (Salicaceae) collected in Amir Dizaj village (Azarshahr); *Aculus mogeri* Farkas, 1960 from *Populus trichocarpa* Torr. & Grey (Salicaceae) and *Aculops allotrichus* (Nalepa, 1894) from *Robinia* sp. (Fabaceae) collected in Kandovan village (Osku); *Aceria* **sp. nov.** species from *Ulmus minor* Mill. (Ulmaceae) collected in Osku.

Key words: East Azerbaijan, Eriophyidae, Iran, landscaping trees, Osku.

New records for the eriophyid (Trombidiformes: Eriophyoidea: Eriophyidae) mite fauna of orchards in Iran (Southwest of East Azerbaijan Province)

Parisa LOTFOLLAHI[1], Karim HADDAD IRANI-NEJAD[1], Mohammad KHANJANI[2] and Enrico DE LILLO[3]

1. Department of Plant Protection, College of Agriculture, University of Tabriz, Tabriz, Iran, postal code: 5166616471. E-mail: prslotfollahy@yahoo.com. 2. Department of Plant Protection, Faculty of Agriculture, University of Bu-Ali Sina, Hamadan, Iran; 3. Department of Soil Sciences, Plant and Food, University of Bari Aldo Moro, Bari, Italy.

In early August 2011, samples of fruit trees in the southwest of East Azerbaijan Province were taken. By using a washing method, eriophyid mites (Trombidiformes: Eriophyoidea: Eriophyidae) were extracted from the plants, prepared, slide mounted and identified. Eight species belonging to 7 genera were identified as follows: 1one genus and four species are new records for the mite fauna of Iran and are indicated with an asterisk:
Phyllocoptes abaenus Keifer, 1940* from *Prunus armeniaca* L. (Rosaceae), Kandovan village (Osku) and Azarshahr, and from *Cerasus vulgaris Mill.* (Rosaceae), Osku; *Aculus fockeui* (Nalepa & Trouessart, 1891)* from *Prunus amygdalus* Stokes (Rosaceae), Azarshahr and from *Malus domestica* Borkh. (Rosaceae), Kandovan village (Osku) and Azarshahr; *Calepitrimerus baileyi* Keifer, 1938 from *Malus domestica* Borkh. (Rosaceae), Kandovan village (Osku) and Azarshahr; *Eriophyes similis* (Nalepa, 1890) from *Prunus domestica* L. (Rosaceae), Kandovan village (Osku); *Eriophyes pyri* (Pagenstecher, 1857) from *Pyrus communis* L. (Rosaceae), Sardrud; *Coptophylla** *lamimani* (Keifer, 1939) from *Corylus avellanae* L. (Betulaceae), Azarshahr; *Aceria mori* (Keifer, 1939)* from *Morus alba* L. (Moraceae) Azarshahr; *Colomerus vitis* (Pagenstecher, 1857) from *Vitis vinifera* L. (Vitaceae), Osku.

Key words: East Azerbaijan, Eriophyidae, fauna, Iran, orchard.

Camerobiid mites (Acari: Trombidiformes) of Northwest Iran

Naser MALEKI, Mohammad BAGHERI, Gholamhossein GHAREKHANI and Abbas ALAMI
Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran. E-mail: nasermaleki68@yahoo.com

The family Camerobiidae Southcott comprises mites with a discoidal idiosoma and slender legs, much longer than idiosoma. Therefore, they are called stilt-legged mites. Members of this family have seldom been referred to in acarology literature. However, more attention is paid to this family recently due to the increasing importance of biological control of members of this family as predators of other mites and small insects. Camerobiidae is widely distributed and found in different habitats, such as the plants canopy, soil, grasses, straw, moss, leaf litter and bark. In order to study the camerobiid mites of Northwest Iran, mites were collected and then extracted from soil and aerial parts of plants by using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium and slides were kept in oven at 45 °C for one week then examined at 1000× magnification under an Olympus BX41 phase contrast microscope. In this study, two genera and four species collected and identified as follows of which one species of the genus *Tycherobius* is new species. One known species, *Neophyllobius astragalusi* Khanjani & Ueckermann (2002) is redescribed and new data are provided.
Neophyllobius asalii Khanjani & Ueckermann, 2002; *N. astragalusi* Khanjani & Ueckermann, 2002; *N. persiaensis* Khanjani & Ueckermann, 2002; *Tycherobius* **sp. nov.**

Key words: predatory mites, Camerobiidae, *Tycherobius*, Iran.

Mites of the family Stigmaeidae (Acari: Prostigmata) in Hamedan Province, Iran

Ladan MOHAMADI[1], Mohammad KHANJANI[1] and Alireza NAZARI[2]
1. Department of plant protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran. E-mail: Ladanewlife@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Islamic Azad University, Arak Branch, Arak, Iran.

Stigmaeidae is family within the superfamily Raphignathoidea. These mites live in or on soil, grass, leaf, mulch, lichen, bark, crevices in rock and leaf cavities. During 2011–2012 in a faunistic survey of Hamedan Province, stigmaeid mites were collected from soil and leaves and mounted in Hoyer's medium. A total of 11species belonging to four genera were identified. Among them two species are new to science and marked with two asterisks (**). Mite species are listed according to their genera as follows:
Stigmaeus boshroyehensis Khanjani, Izadi, AsaliFayaz, Raisi, Rostami and Doğan, 2010, *Stigmaeus elongatus* (Berlese, 1886), *Stigmaeus iraniensis* Bagheri, Gheblealivand and Ghorbani, 2012, *Stigmaeus caria* Khanjani, Pishehvar, Mirmoayedi and Khanjani, 2012, *Stigmaeus pilatus* (Kuznetzov, 1978), *Stigmaeus ladanae* Nazari, Khanjani and Kamali, 2012*, Stigmaeus* sp.nov**, *Storchia ardabiliensis* Safasadati, Khanjani, Razmjou and Doğan, 2010, *Eustigmaeus nasrinae* Khanjani & Ueckermann, 2002, *Eustigmaeus dogani* Khanjani, Asali Fayaz, Mirmoayedi and Ghaedi, 2011 and *Eryngiopu s*sp. Nov.**

Key words: Fauna, Acari, Stigmaeidae, new species, Hamedan.

Fauna of terrestrial Parasitengona (Acari: Trombidiformes) ectoparasitic on Arthropoda in Mehriz and Taft regions, Yazd Province, Iran

Somayeh MOHAMADI[1], Alireza SABOORI[2], Masoud HAKIMITABAR[3] and Majid FALAHZADE[1]

1. Department of Entomology, Jahrom Branch, Islamic Azad University, Jahrom, Iran. Emails: mohamadi.somaye1362@gmail.com, mfalahm@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. Email: saboori@ut.ac.ir; 3. Department of Plant Protection, College of Agriculture, University Shahrood, Shahrood, Iran. Email: hakimitabar@yahoo.com

During a faunistic survey on terrestrial parasitengone mites ectoparasitc on arthropods, carried out in 2010–2011in Mehriz and Taft regions of Yazd Province, 12 species representing nine genera and three families were collected. Specimens were detached from wings and bodies of arthropods by an entomological pin. Among them, two species were new to science. New species were marked by one asterisk. Mites species are listed as follows: I. Erythraeidae: *Erythraeus* (*Erythraeus*) sp. nov.*; *Erythraeus* (*Erythraeus*) *garmsaricus* Saboori, Goldarazena & Khajeali, 2004; *Erythraeus* (*Zaracarus*) *rajabii* Saboori, 2000; *Charletonia terianae* Hakimitabar, Saboori and Seiedy, 2013; *Charletonia krendowskyi* (Feider, 1954); *Marantelophus bella* (Zhang, 1996); *Leptus (Leptus*) sp. nov.*; *Nagoricanella* sp.; II. Family Trombidiidae: *Cicaditrombium weni* Saboori and Lazarboni, 2007; *Allothrombium shirazicum* Zhang, 1996; *Willmannella kazerunica* Zhang & Saboori, 1997; *Atractothrombium sylvaticum* (C.L. Koch, 1835).

Key words: Yazd Province, Prostigmata, Taft, Mehriz, Iran.

First record of the *biunguis* species group (Acari: Podapolipidae: *Eutarsopolipus*) parasitising carabid beetles from Iran

Abdolazim MORTAZAVI, Hamidreza HAJIQANBAR and Karim KAMALI
Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran. E-mail: abdolazim.mortazavi@modares.ac.ir

Mites in the family Podapolipidae (Acari: Heterostigmatina) are highly specialized ecto- and endoparasites of insects of the orders Blattaria, Heteroptera, Hymenoptera, Orthoptera, and especially Coleoptera. During study of mites associated with insects in Hormozgan Province, southern Iran in 2012, two colonies of podapolipid mites of the genus *Eutarsopolipus* collected from under elytra of *Philorhizus* sp. and *Drypta lineola* MacLeay (Coleoptera: Carabidae). The mite colonies were belonging to *acanthomus* and *biunguis* groups respectively, the latter new to mite fauna of Iran. Both species of the mentioned groups are new to science and will be described soon. There are 14 species groups in the genus *Eutarsopolipus* of which three following groups have been found in Iran: *acanthomus*, *myzus* and *biunguis*.

Key words: Podapolipidae, *Eutarsopolipus*, *acanthomus* group, Iran, *biunguis* group

Report of two genera of the Bryobiini tribe (Acari: Tetranychidae) new to the fauna of Asia and Iran, with new host reports for the genera

Sayed MOSAYEB MAHDAVI [1], Mahdieh ASADI [2] and Sadegh FARZAN [1]
1. Member of Young Research Society, Shahid Bahonar University of Kerman, Kerman, Iran. E-mail: Mahdavi.mosayeb@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Shahid Bahonar University of Kerman, Kerman, Iran.

During 2011–2012, the fauna of spider mites (Acari: Tetranychidae) in Kerman Province was studied. In this study, two genera belonging to Bryobiini tribe were identified. *Hemibryobia* Tuttle & Baker, 1969 comprises of just two species in the world. This genus was collected from: Manujan (27°19'N 57°29'E) (Manujan - Kerman Province), 18.07.2011 from *Ziziphus* sp. (Rhamnaceae) which is a new host record for this genus in the world. This genus is a new record for Asia and Iran. Furthermore *Strunkobia* Livshitz & Mitrofanov, 1972 comprises of just one species namely *Strunkobia pamirica*, was collected from: Lalezar (29°32'N 56°50'E) (Baft- Kerman Province), 18.07.2011, from *Artemisia* sp. (Asteraceae) which is a new host record for this genus in the world.

Key words: *Hemibryobia*, *Strunkobia*, new report, new host report, Kerman.

Report of a new genus and three subgenera of the tribe Hystrichonychiini (Acari: Tetranychidae) from Iran

Sayed MOSAYEB MAHDAVI [1], Mahdieh ASADI [2] and Sadegh FARZAN [1]
1. Member of Young Research Society, Shahid Bahonar University of Kerman, Kerman, Iran. E-mail: Mahdavi.mosayeb@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Shahid Bahonar University of Kerman, Kerman, Iran.

During a faunistic survey of spider mites of Kerman Province, one genus and three subgenera belonging to the tribe Hystrichonychiini were identified. The genus *Neopterobia* Wainstein, 1956 comprises of three subgenera and over 37 species in the world. Two *Neoptrobia* specimens represented to subgenera, namely, *Neopetrobia* (*Neopetrobia*) and *Neopetrobia* (*Reckia*) Wainstein, 1956. These two subgenera were collected during 2011 in Manoojan, Sirch and Orzoeih. The subgenus *Paraplonobia* (*Anaplonobia*) Wainstein, 1960 comprises 21 species world-wide was collected in Manujan, Kerman Province, from *Tamarix* sp. (Tamaricaceae) which is a new host record for this subgenus in the world. These three species are new to science and under description.

Key words: *Neopetrobia*, *Paraplonobia*, Iran, Kerman, new report.

Report of two new species records of *Tetranychus* (Acari: Tetranychidae) from Kerman and Asia with a new host record

Sayed MOSAYEB MAHDAVI [1], Mahdieh ASADI [2] and Sadegh FARZAN [1]
1. Member of Young Research Society, Shahid Bahonar University of Kerman, Kerman, Iran. E-mail: Mahdavi.mosayeb@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Shahid Bahonar University of Kerman, Kerman, Iran.

The genus *Tetranychus* Dufour, 1832 belongs to the Tetranychiini tribe. This genus comprises of nine groups world-wide. *Tetranychus kanzawai* Kishida, 1927 was collected from Manujan (27°19'N, 57°29'E) (Manujan, Kerman Province), 18.07.2011 on *Morus alba* (Moraceae). This species is a new record for Kerman Province. *Tetranychus tumidosus* Baker & Pritchard, 1960 was collected from Bongan (29°20'N, 56°43'E) (Baft, Kerman Province), 14.10.2011 on *Astragalus* sp. (Fabaceae). This species was known only from South Africa therefore it and its host are new records for Asia.

Key words: new species, new report, *Tetranychus*, Kerman, Iran.

Bdelloid mites fauna of Marand (Northwest of Iran) and the first report of the genus *Rubroscirus* Den Heyer from Iran

Reza NAVAEI-BONAB[1], Majid KAZAZI[1] and Edward A. UECKERMANN[2, 3]
1. Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran. E-mail: Reza_kami2005@yahoo.com; 2. ARC-PPRI, Private Bagx134, Queenswood, Pretoria 0121, South Africa; 3. School of Environmental Sciences and Development, North-West University, Potchefstroom Campus 2520, South Africa

Bdelloidea including the families Bdellidae and Cunaxidae, are free living predators and feeding on nematodes, springtails, other mites and small arthropods. Bdelloid mites are interesting in agricultural acarology because of their potential in biological control. In order to study the bdelloid mites of Marand area (East Azerbaijan Province), soil samples were taken during 2010. Mites were collected using Berlese-Tullgren funnel, cleared in Nessbitt's fluid and mounted on microscopic slides. In this study, two families, 11 genera, and 15 species were identified. Among them, four species were new to the science and one genus was new record for the mite fauna of Iran which are marked by two and one asterisks, respectively (the species belong to the genus *Rubroscirus*, is new species to science). List of species are as the follows:
Cunaxidae: *Cunaxa capreolus* (Berlese); *Cunaxa setirostris* Hermann, 1804, *Dactyloscirus* sp. nov.**, *Coleoscirus tuberculatus* Den Heyer, 1978, *Coleobonzia* sp. nov.**, *Lupaeus* sp. nov.**, *Cunaxoides* sp. nov.**, *Rubroscirus** sp. nov., *Pulaeus* sp. nov.**, *Pulaeus martini* Den Heyer, 1981, *Pulaeus krama* Chaudhri, Abkar & Rasool, 1979. Bdellidae: *Cyta latirostris* Hermann, 1826; *Bdella muscorum* Ewing, 1909, *Bdella* sp. nov.**, *Spinibdella cronini* Baker & Balock, 1944.

Key words: Acari, Bdelloidea, *Rubroscirus,* Marand, Iran.

Mites of the family Stigmaeidae (Acari: Trombidiformes) in Marand region (East Azerbaijan Province) with a new species of the genus *Eustigmaeus* Berlese, 1910

Reza NAVAEI-BONAB[1] and Ehsan PARSAEYAN[2]
1. Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran. E-mail: Reza_kami2005 @yahoo.com; 2. Department of Plant Protection, College of Agriculture, University of Maragheh, Maragheh, Iran.

Stigmaeid mites (Acari: Trombidiformes) are commonly predators and feed on a variety arthropods such as spider mites and scale insects, or their eggs. This family comprises various genera, which are found in different ecosystems like soil, litter, mosses, plant foliage and vegetation or on the body of sandflies. In order to study the stigmaeid mites of the Marand area (East Azerbaijan Province), soil samples were taken during 2011. Stigmaeid mites were extracted using Berlese-Tullgrene funnel, then cleared in Nessbitt's fluid and mounted on microscopic slides. In this study, seven genera and 17 species were identified of which one species is new to science and marked by an asterisk. List of species are as follows:
Stigmaeus boshroyehensis Khanjani, Izadi, Asali Fayaz, Raisi, Rostami & Dogan, 2010, *Stigmaeus elongatus* Berlese, 1886, *Stigmaeus pilatus* Kuznetzov, 1978, *Stigmaeus shabestariensis* Haddad, Lotfollahi & Akbari, 2010, *Eustigmaeus* sp. nov.*, *Eustigmaeus segnis* (Koch), 1836, *Eustigmaeus nasrinae* Kanjani & Ueckermann, 2002, *Eustigmaeus setiferus* Bagheri, Saber, Ueckermann, Ghorbani & Navaei, 2011, *Eustigmaeus ioanninensis* Kapaxidi & Papadoulis, 1999, *Eustigmaeus azerbaijaneansis* Haddad, Lotfollahi & Akbari, 2011, *Cheylostigmaeus gharakhanii* Navaei-Bonab & Bagheri, 2011, *Cheylostigmaeus hassanpouri* Bagheri, 2011, *Agistemus industani* Gonzalez-Rodriguez, 1965, *Storchia robusta* (Berlese) Oudemans, 1923, *Ledermuelleriopsis zahiri* Khanjani & Ueckermann, 2002, *Ledermulleriopsis plumosa* Willmann, 1951, *Zetzellia mali* (Ewing) Summers, 1960.

Key words: Acari, Stigmaeidae, *Eustigmaeus*, Marand.

Some Pseudocheylidae (Acari: Trombidiformes) of Marand (Northwest of Iran)

Reza NAVAEI-BONAB and Majid KAZAZI
Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran. E-mail: Reza_kami2005 @yahoo.com

Members of the family Pseudocheylidae are thought to be predators and are found under tree bark, in litter and nests, and on moss and sometimes in soil. The family currently comprises of three genera, *Anoplocheylus*, *Neocheylus* and *Pseudocheylus*. In order to study of mite fauna of Marand region (East Azerbaijan Province), samples were taken from soil and leaves of crops, orchards and weeds during 2011. Mites were extracted using a Berlese funnel and after clearing in Nesbitt's fluid, mounted and identified. In this study, four species were identified of which one species was new to science which marked with an asterisk.
Anoplocheylus malayeriensis Ueckermann & Khanjani, 2004, *Anoplocheylus bonabjadidiensis* Navaei-Bonab, 2011, *Anoplocheylus sinai* Bagheri, 2013 and *Anoplocheylus* sp. nov.*

Key words: Acari, Pseudocheylidae, *Anoplocheylus*, Trombidiformes, Marand, Iran.

Mites of the Superfamily Rhaphignathoidea (Acari: Trombidiformes: Prostigmata) in three western Provinces of Iran

Alireza NAZARI[1], Mohammad KHANJANI[2] and Karim KAMALI[3]
1. Department of Plant Protection, College of Agriculture, Islamic Azad University, Arak Branch, Arak, Iran. E-mail: nazariazad@yahoo.com; 2. Department of Plant Protection, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran; 3. Department of Plant Protection, College of Agriculture, Islamic Azad University, Science and Research Branch, Tehran, Iran.

Mites of the superfamily Raphignathoidea are biological control agents of spider mites, eriophyid mites, and scale insects in agriculture and forestry. During 2009–2011, in a faunistic survey of Hamedan, Kermanshah and Kurdestan Provinces, raphignathoid mites were collected from soil and leaves and mounted in Hoyer's medium. In this study, 19species belonging to 5 different families and 10 genera were identified. Among them one species was new to science which is marked by an asterisk (*). Mite species are listed according to their genera as follows:
Stigmaeidae: *Stigmaeus ladanae* Nazari, Khanjani & Kamali, 2012, *S. nasrinae* Nazari, Khanjani & Kamali, 2012, *S. boshroyehensis* Khanjani, Asali-Fayaz, Mirmoayedi & Ghaedi, 2010, *S. Pilatus* Kuznetzov, 1978, *S. ueckermanni* Pahlavan-Yali, Khanjani & Razmjou, 2011, *S. longipilis* Canestrini, 1889; *Eustigmaeus doganii* Khanjani, Asali-Fayaz, Mirmoayedi & Ghaedi, 2011; *Zetzellia pourmirzaei* Khanjani & Ueckermann, 2008; *Cheylostigmaeus ferdowsii* Khanjani, Raisi, Iz*adi* & Ueckermann, 2010; *Storchia ardabiliensis* Safasadati, Khanjani, Razmjou and Doğan, 2010; *Ledermuelleriopsis zahirii* Khanjani & Ueckermann, 2002, *L. dogani* Khanjani and Pakdelan, 2012;
Camerobiidae: *Neophyllobius asalii* Khanjani & Ueckermann, 2006, *N. zolfigolii* Khanjani, Asali-Fayaz & Nori-Ghanbalani, 2010; Raphignathidae: *Raphignathus hecmatanaensis* Khanjani & Ueckermann, 2002; Cryptognathidae: *Favognathus mirazii* Khanjani & Ueckermann, 2008; Caligonellidae: *Neognathus rijabicus** sp. nov.; *Molothrognathus bahariensis* Ueckermann & Khanjani, 2002 and *M. azazi* Ueckermann & Khanjani, 2002.

Key words: fauna, mites, Raphignathoidea, new species, western Iran.

Fauna of terrestrial parasitengone mites (Acari: Prostigmata) in Guilan Province, Iran

Javad NOEI[1], Alireza SABOORI[2] and Jalil HAJIZADEH[1]
1. Department of Plant Protection, College of Agricultural Sciences, University of Guilan, P.O. Box 41635-1314, Rasht, Iran. E-mails: noei.javad@gmail.com, jhajizadeh@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran; E-mail: saboori@ut.ac.ir

During an investigation of terrestrial parasitengone mites in Guilan Province in 2010–2012, 16 larval species were collected from soil samples and hosts. These mites belong to six families, 11 subfamilies and 13 genera. Among them, one species was new to science, six species were new to the fauna of Iran and four species were new to Guilan Province (new species and new records for Iran and Guilan Province are marked by one, two and three asterisks, respectively): Chyzeriidae: *Ralphaudyna iranensis* Zhang & Saboori, 1995***; Erythraeidae: *Erythraeus* (*Erythraeus*) *southcotti* Goldarazena & Zhang, 1998**, *Erythraeus* (*Zaracarus*) *ueckermanni* Saboori, Nowzari & Bagheri-Zenouz, 2004, *Moldoustium* sp. nov.*, *Leptus* sp. 1, *Leptus* sp. 2, *Abrolophus iraninejadi* Saboori & Hajiqanbar, 2005; Smarididae: *Hirstiosoma latreillei* (Grandjean, 1947)**, *Fessonia papillosa* (Hermann, 1804)**; Johnstonianidae: *Johnstoniana parva* Wendt, Wohltmann, Eggers & Otto, 1994**; Microtrombidiidae: *Enemothrombium culicoidium* (Vercammen-Grandjean & Cochrane, 1974)**; Trombidiidae: *Allothrombium pulvinum* Ewing, 1917, *A. triticium* Zhang, 1995; *Trombidium payamiensis* Saboori, Lotfollahi & Haddad Irani-nejad*** and *Paratrombium megalochirum* (Berlese, 1910)**

Key words: new records, Erythareidae, Smarididae, Trombidiidae, Microtrombidiidae, Chyzeriidae.

Faunistic study of the families Raphignathidae and Cryptognathidae (Acari: Trombidiformes) from Lorestan Province, Iran

Mojtaba RAHMATI[1], Katayoon KHERADMAND[1], Shahriar JAFARI[2] and Mohammad BAGHERI[3]
1. Department of Entomology and Plant Pathology, College of Aboureihan, University of Tehran, Pakdasht, Iran. E-mail: kkheradmand@ut.ac.ir; 2. Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: Jafari.s@lu.ac.ir; 3. Department of Plant Protection, Faculty of Agriculture, Maragheh University, Maragheh, Iran. E-mail: mbagheri20022002@yahoo.com

The Raphignathoidea Kramer, 1877 comprises a large cosmopolitan group of families, which are found in various ecosystems: foliage, branches, trunks, moss and lichen, litter, soil, animal nests, stored products, and even in house dust. The majority of the raphignathoid mites are free-living predators but a few are phytophagous, feeding on moss, and some species are parasites or symbionts of insects (Doğan, 2006). Raphignatidae and Cryptognatidae belong to this superfamily and a faunistic study to determine the species diversity of them was carried out in Lorestan Province during 2012. Mites were extracted from soil and aerial parts of host plant by using a Berlese-Tullgren funnel. Specimens were cleared in Nesbitt's fluid, mounted in Hoyer's medium and examined at 1000× magnification under an Olympus BX41 phase contrast microscope. In this study, eight species were collected and identified of which one of them is a new record for Iran and one species is a new species which marked with one and two asterisk, respectively.
Raphignathidae: *Raphignatus zhaoi* Hu, Jing & Liang, *R. gracilis* (Rack), *R. giselae* Meyer & Ueckermann, *R. collegiatus* Atyeo, Baker & Crossley, *R. sceptrum* Chaudhri, Akbar and Rasool and *Raphignathus* sp. nov.**; Cryptognathidae: *Favognathus amygdalus* Doğan and Ayyıldız* and *F. cordylus* Loxton*.

Key words: Fauna, Raphignathidae, Cryptognathidae, Lorestan Province, Iran.

Fauna of prostigmatic predatory mites in fruit orchards of Torbate-Jam County, Khorasan Razavi Province, Iran

Ameneh RAHMDELI[1], Soltan RAVAN[1], Mahdi JALAEIAN[2] and Ehsan RAKHSHANI[1]
1. Department of Plant Protection, College of Agriculture, University of Zabol, Zabol, Iran. E-mail: Rahmdelia@yahoo.com;
2. Department of Plant Protection, Rice Research Institute of Iran, Rasht, Iran. E-mail: mahdi_jalaeian@yahoo.com

Prostigmatic mites are found in various habitats and are morphological and biological diverse. Members of some families are predators preying on other mites and small arthropods, as well as their eggs. The prostigmatic predatory mite fauna in fruit orchards of Torbate-Jam County (Khorasan Razavi Province, Iran) was studied during 2010-2011. The specimens were collected from soil, weeds and leaves and branches of fruit trees. Mites were extracted in Berlese funnels, collected under a stereomicroscope, cleared in Lactic acid and mounted in Hoyer's medium. In total 22 species belonging to 16 genera and eight families were identified. Four species of them are new records for the mite fauna of Iran and two species are new for science and will be described soon. The new records and new species are marked by one and two asterisks, respectively. The other species are new records for the mite fauna of Khorasan Razavi Province. The species are as follows:
Anystidae: *Anystis baccarum* (L., 1758), *Tarsolarkus longisetus* Barilo, 1984; Camerobiidae*: Neophylobius* nr. *levanticola* * Bolland, 1991, *Neophylobius* nr. *asalii* Khanjani & Ueckermann, 2006; Stigmaeidae: *Eustigmaeus anauniensis** (Canestrini, 1889), *Ledermuelleriopsis zahiri* Khanjani & Ueckermann, 2002, *L. plumosus* Willmann, 1951, *Stigmaeus elongatus* Berlese, 1886, *S. planus** Kuznetzov, 1978; Raphignathidae: *Raphignathus africanus** Meyer & Ueckermann, 1989, *R. collegiatus* Atyo, Baker & Crossley, 1961, *R. hecmatanaensis* Khanjani & Ueckermann, 2003, *R. zhaoi* Hu, Jing & Liang, 1995; Cunaxidae: *Cunaxa capreolus* Berlese, 1889; *Lupaeus* sp. nov.**, *Pulaeus* sp. nov.**; Bdellidae: *Spinibdella cronini* (Baker & Balock, 1962); *Cyta latirostris* (Hermann, 1804); Cheyletidae*: Acaropsellina* (=*Acaropsis*) sp.; *Acaropsella volgini* (Gerson, 1967), *Cheyletus cacahuamilpensis* Baker, 1949 (syn. *C.baloghi* Volghin, 1969); Pseudocheylidae: *Anoplocheylus malayeriensis* Ueckermann & Khanjani, 2004.

Key words: fauna, prostigmatic predatory mites, orchards, Torbate-Jam.

Faunistic study of Tenuipalpidae (Acari: Prostigmata) in Mazandaran Province, North of Iran

Mohammad RAISSI ARDALI[1], Alireza HADIZADEH[2], Hamidreza HAJIQANBAR[3], Mahmoud MOHAMMADI SHARIF[2] and Eddie A. UECKERMANN[4]

1. Department of Plant Protection, Agricultural Sciences and Natural Resources University, Sari, Mazandaran, Iran. E-mails: Raissi_mohammad@yahoo.com, arhadizadeh@gmail.com, msharif53@yahoo.com; 2. Department of Plant Protection, Tarbiat Modares University, Tehran, Iran. 4. ARC-Plant Protection Research Institute, Private Bag x134, Pretoria, 0001, South Africa

False spider mites are phytophagus and cosmopolitan. They have a great number of hosts, including fruit trees, ornamentals and forest plants. In a faunistic study of the family Tenuipalpidae more than 150 plant species were sampled during 2011–2012 in Mazandaran Province. The mites cleared in Nesbitt's fluid and microscopic slides were prepared using Hoyer's medium. A total of 12 species belonging to five genera were identified. The species marked with one and two asterisks are new for the fauna of Mazandaran Province and Iran, respectively. The mite species are listed according to their genus as follows:

Aegyptobia beglarovi Livschitz & Mitrofanov*, *Brevipalpus californicus* Banks**, *Brevipalpus lewisi* McGregor, *Brevipalpus obovatus* Donnadieu; *Cenopalpus bakeri* Düzgünes, *Cenopalpus* nr. *carpini* Livschitz & Mitrofanov, *Cenopalpus irani* Dosse, *Cenopalpus crataegi* Dosse, *Cenopalpus rubusi* Khanjani*, *Pentamerismus* nr. *juniperi* Reck, *Pentamerismus oregonensis* McGregor, *Tenuipalpus punicae* Pritchard & Baker.

Key words: Tenuipalpidae, Mazandaran Province, Iran, new record.

Laelapid mites (Acari: Mesostigmata) associated with scarab beetles (Coleoptera: Scarabaeidae) in Alborz Province, Iran

Nastaran RAZAVI SUSAN[1], Katayoon KHERADMAND[1], Omid JOHARCHI[2] and Alireza SABOORI[3]

1. Department of Entomology and Plant Pathology, College of Aboureihan, University of Tehran, Pakdasht, Iran. E-mails: nastooh90@gmail.com, kkheradmand@ut.ac.ir; 2. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. E-mails: joharchi@iauyazd.ac.ir, j.omid2000@gmail.com; 3. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir

Mites of the family Laelapidae are abundant in agricultural ecosystems, especially in association with scarab beetles (Scarabaeidae: Coleoptera). During this investigation, six species belonging two genera of Laelapidae were collected and identified in Alborz Province, during 2012–2013. All identified species and their hosts are listed below. *Hypoaspis rhinocerotis* Oudemans, 1925 is reported for the first time from Iran. This species was described by Oudemans, 1925 from Ambon Island which is a part of the Maluku Islands of Indonesia, on *Oryctes rhinoceros* (Linnaeus, 1758). This species can be easily recognised by its short dorsal shield setae, strernal setae reaching well past the base of next posterior setae, and the slightly long dorso-distal seta *ad*1 on genu IV, as well as one macrosetae on femura II-IV.

Coleolaelaps costai Joharchi & Halliday, 2011 ♀ [*Polyphylla olivieri*], *Hypoaspis integer* Berlese, 1911 ♀ [*Polyphylla* sp.], *Hypoaspis maryamae* Joharchi & Halliday, 2011 ♀ [*Polyphylla olivieri*], *Hypoaspis pentodoni* Costa, 1971 ♀ [*Polyphylla olivieri*], *Hypoaspis rhinocerotis* Oudemans, 1925* ♀[*Oryctes* sp.], *Hypoaspis terrestris* (Leonardi, 1899) ♀ [*Polyphylla olivieri*].

Key words: new record, *Hypoaspis*, Laelapidae, Scarabaeidae, Iran.

Epicrius tauricus Bregetova, first species report of the family Epicriidae (Acari: Mesostigmata) from Iran

Shahrooz KAZEMI[1] and Saeid PAKTINAT SAEEJ[2]
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mails: shahroozkazemi@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran.

The Epicriidae is a free-living family of Mesostigmata, small to medium in size and contains four genera of which the *Epicrius* G. Canestrini & Fanzago, 1877 includes about 35 described species in Palearctic. They are one of important components, especially in forest litter microhabitats. The family Epicriidae is very poorly known in Iran and only two unidentified species of the genus *Epicrius* have been reported from Kerman and Mazandaran Provinces so far. During a study in 2012 on edaphic mites in Amol County, Mazandaran Province, male specimens of *E. tauricus* Bregetova, 1977 were collected and identified. Mites were extracted from soil and forest litter using a Berlese-Tullgren funnel, cleared in lactophenol and mounted in Hoyer's medium by junior author and then identified by senior author. Male specimens of this species can be easily distinguished from other species of the genus by a free anal shield containing a pair of pre-anal setae in addition to circum-anal setae, ventral shield bearing two pairs of setae and posterior margin of sternal shield truncate.

Key words: Acari, Mesostigmata, Epicriidae, *Epicrius tauricus*, Mazandaran, Iran.

The Laelapidae mites (Acari: Mesostigmata) from Mazandaran Province, North Iran

Shahrooz KAZEMI[1], Asma RAJAEI[1] and Saeid PAKTINAT SAEEJ[2]
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: shahroozkazemi@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran.

The superfamily Dermanyssoidea comprises a large and diverse group of free-living and parasite mites. The most important family of the taxa is Laelapidae which divided into nine subfamilies and comprises morphological and behavioral variety of dermanyssoid mites. Subfamilies are Hypoaspidinae Vitzthum, 1940, Melittiphidinae Evans and Till, 1966, Haemogamasinae Oudemand, 1926, Myonyssinae Bregetova, 1956, Hirstionyssinae Evans and Till, 1960, Mesolaelapinae Tenorio and Radovsky, 1974, Alphalaelapinae Tipton, 1960, Laelapinae Berlese, 1892, Acanthochelinae Radovsky and Gettinger, 1999. The largest subfamily is Hypoaspidinae which includes hundreds of species obligate and facultative parasites of vertebrates, insect paraphages and free-living predators that inhabit in soil and litter habitats, and nest of vertebrates and invertebrates. In a survey on edaphic mites of the family Laelapidae in Mazandaran Province, North Iran, several species of the family were extracted by a Berlese-Tullgren funnel, cleared in lactophenol and mounted in Hoyer's medium. List of the species is as follows: *Gaeolaelaps aculeifer* (G. Canestrini, 1884), *G. queenslandicus* (Womersley, 1956), *Gymnolaelaps myrmecophilus* (Berlese, 1892), *Cosmolaelaps lutegiensis* (Scherbak, 1971) and *C. ornatus* Berlese, 1903.

Key words: Mesostigmata, Dermanyssoidea, Laelapidae, *Cosmolaelaps ornatus*, Iran.

New records of the family Laelapidae (Acari: Mesostigmata) from Guilan Province, and a new record for Iran

Sara RAMROODI[1], Jalil HAJIZADEH[2] and Omid JOHARCHI[3]
1. Department of Plant Protection, Faculty of Agricultural Sciences, University of Guilan, P.O. Box 41635-1314, Rasht, Iran and Department of Plant Protection, Faculty of Agricultural Sciences, University of Zabol; Zabol, Iran. E-mail: sara_ramroodi@yahoo.com; 2. Department of Plant Protection, Faculty of Agricultural Sciences, University of Guilan, P.O. Box 41635-1314, Rasht, Iran. E-mail: hajizadeh@guilan.ac.ir; 3. Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. E-mail: joharchi@iauyazd.ac.ir, j.omid2000@gmail.com

The mite family Laelapidae is ecologically diverse, including obligate and facultative parasites of vertebrates, insect paraphages, and free-living predators that inhabit soil-litter habitats and the nests of vertebrates and arthropods. A faunistic survey was carried out in Guilan Province in spring and summer 2012. Soil mites of the family Laelapidae were collected from soil and litter and extracted by means of the Berlese-Tullgren funnel. A total of 10 species belonging to eight genera of the family Laelapidae was collected and identified, of which one species is a new record for Iran (marked *), and the other species are new records for Guilan Province. The identified species are as follows:
Euandrolaelaps sardoa (Berlese, 1911), *Gaeolaelaps praesternalis* (Willmann, 1949), *Gymnolaelaps myrmecophilus* (Berlese, 1892), *Haemolaelaps shealsi* (Costa, 1968), *Laelaspisella canestrinii* (Berlese, 1903), *Laelaspis pennatus* Joharchi & Halliday, 2012, *Laelaspis astronomicus* (Koch, 1839), *Laelaspis dariusi* Joharchi & Jalaeian, 2012, *Ololaelaps ussuriensis* Bregetova & Koroleva, 1964 *, *Pseudoparasitus dentatus* (Halbert, 1920).

Key words: Acari, Laelapidae, Guilan, fauna, Iran.

Fauna of terrestrial parasitengone mites (Acari: Trombidiformes) ectoparasitic on insects in East Mazandaran, Iran

Mahsa SAMANIPOUR[1], Alireza SABOORI[2], Masoud HAKIMITABAR[3], Alireza JALALIZAND[1] and Seied Hossein HASHEMINASAB PABANDI[1]
1. Department of Entomology, Khorasgan (Isfahan) Branch, Islamic Azad University, Isfahan, Iran. E-mails: ent_samanipour @yahoo.com, arjalalizand@gmail.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir; 3. Department of Plant Protection, University of Shahrood, Shahrood, Iran. E-mail: hakimitabar@yahoo.com

In the study accomplished during 2011–2012 to determine of terrestrial parasitengone mites fauna in East Mazandaran Province, Iran, totally, 11 species belonging to eight genera and four families were collected. Among the samples collected, three species were new to science. All species are collected in larval stage and detached from body of insects. New species were marked by one asterisk. Mite species are listed as follows: I. Family Erythraeidae: *Erythraeus (Zaracarus) ueckermanni* Saboori, Nowzari & Bagheri-Zenouz, 2004, *Abalakeus gonabadensis* Ahmadi, Hajiqanbar & Saboori, 2012, *Charletonia* sp. nov. 1*, *Charletonia* sp. nov. 2*, *Charletonia* sp. nov. 3*, *Leptus* sp. 1, *Leptus* sp. 2, II. Family Trombidiidae: *Allothrombium pulvinum* (Ewing, 1917), III. Family Microtrombidiidae: *Eutrombidium sorbasiensis* Mayoral & Barranco, 2004, *Montenegtrombium milicae* Saboori & Pešić, 2006; IV. Family Chyzeriidae: *Ralphaudyna iranensis* Zhang & Saboori, 1995.

Key words: Acariformes, Prostigmata, Parasitengona, new species, Iran.

Geographic distribution of Ixodid ticks (Acari: Ixodidae) in north of Iran using GIS

Moslem SARANI [1], Mohammad Mehdi SEDAGHAT [1], Zakieh TELMADARRAIY [1], Abdolreza SALAHI MOGHADDAM[2], Kamal AZAM [3] and Abbas ZIEGHAMI [4]

1. Department of Medical Entomology and Vector Control, School of Public Health, Tehran university of Medical Sciences, P.O. box: 14155-6446, Tehran, Iran. E-mail: sarani@razi.tums.ac.ir; 2. Hormuzgan University of Medical Sciences, Bandar Abbas, Iran. 3. Department of Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran. 4. Department of Veterinary, Gonbad-Kavoos, Golestan Province, Iran.

Ticks as ectoparasites and also vectors of human and animal diseases are considered among the most important arthropods. They are ideal organisms for Geographical Information Systems (*GIS*) because environmental elements including elevation, temperature, rainfall, and humidity influence their presence, development, activity and longevity. *GIS* provide tools for modeling the occurrence of species in space and time. Hard ticks in Iran, considered as important vectors of human and animal diseases. Hard tick infestation on livestock was surveyed in two districts in mountainous areas of Golesatan Province, Ramian and Azadshahr. Tick collections were carried out during four seasons twice in season over a period of 12 months from March 2009 through February 2010. A total of 255 ticks were collected from 219 ruminants including 44 sheep, 63 goats, 99 cows, 13 camels. The geographical points were recorded using a handy GPS Garmin e-Trex HCX. Software ArcGIS, ver. 9.3 was used for mapping and spatial analysis. Five species were identified as follows: *R.sanguineus* (65.5%), *R.bursa* (4.6%), *H.marginatum* (19.9%), *H.anatolicum* (6%), and *H.asiaticum* (4%). Infestation rates in hosts were goats (45%), cows (14%), sheep (36%), and camels (5%). The most abundant tick species in all seasons in two districts was *R. sanguineus.* Goats were the most infested host among the ruminants in the area. The geographical distributions of each tick species and tick infested host will be presented as maps, and the ixodid species infesting cattle will be presented in a table. In this study, we used GIS to clear the status of each hard tick species on its host in the Golestan Province.

Key words: GIS, hard ticks, north Iran, Golestan.

The first non-arthropod host for *Leptus* Latreille, 1796 (Acari: Erythraeidae)

Marjan SEIEDY[1], Hamed OSTOVARI[1] and Masoud HAKIMITABAR[2]

1. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran. E-mail: mseyyedi@ut.ac.ir; 2. Department of Plant Protection, College of Agriculture, University of Shahrood, Shahrood, Iran. E-mail: hakimitabar@yahoo.com

In July 2012, one species of bat, *Rhinolophus euryale* Blasius, 1853 (Chiroptera: Rhinolophidae) was collected from Ferdows city, Iran. It belongs to the second biggest genus of bats in the world, the *Rhinolophus* or horseshoe bats. Bats in the genus *Rhinolophus* are named for the distinctive horseshoe-shaped fold of skin which forms a part of the characteristic noseleaf. *Rhinolophus euryale* tends to live in warm, wooded areas in foothills and mountains, preferring limestone areas with numerous caves and nearby water. Roosts are frequently shared with other horseshoe bat species, although without any kind of intermingling. Mediterranean horsehoe bats leave their roosts in late dusk, hunting low over the ground on warm hillsides but also in relatively dense tree cover, preying on moths and other small insects. When the body of bat was studied, five specimens of one species of the genus *Leptus* belonging to the family Erythraeidae was found on noseleaf of bat. The genus *Leptus* contains two subgenera, *Leptus* and *Amaraptus*. There are 223 and one species in subgenera *Leptus* and *Amaraptus*, respectively. All of them are ectoparasites of Arthropoda specially insects. *Rhinolophus euryale* is the first non-arthropod host for *Leptus*. The species is new to science and will be descibed in future.

Key words: *Rhinolophus euryale*, *Leptus*, *Amaraptus*, bat.

First record of the genus *Silphitrombium* (Acari: Trombidiformes: Prostigmata: Neothrombiidae) from Iran

Samaneh TASHAKOR[1], Hamidreza HAJIQANBAR[1] and Alireza SABOORI[2]
1. Department of Entomology, Faculty of Agriculture, Tarbiat Modares, University, 14115-336, Tehran, Iran. E-mail: samanehtashakor@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir

The Neothrombiidae is a small but widespread family of parasitengone mites including about 27 species in 17 genera. Deutonymphs and adults occur in various edaphic habitats and the larvae of most species are parasites on insects, especially Orthoptera and Coleoptera. During an investigation on mites associated with insects in Sistan and Baluchestan Province (eastern Iran) in 2011 and 2012, two colonies belonging to two species of the genus *Silphitrombium* were found. This is the first record of the genus *Silphitrombium* from Iran. Both species are new to science. The host beetles were identified as *Opatroides punctulatus* Brullé, 1832 (Tenebrionidae) and *Heteroderes heideni* Reitter, 1891 (Elateridae). Fain (1992) described *Silphithrombium furculigerum* based on larvae from a carrion beetle of the family Silphidae, from Belgium, thus the host records of the families Tenebrionidae and Elateridae should be also regarded as new.

Key words: Acari, Prostigmata, *Silphitrombium*, new record, Coleoptera, *Opatroides punctulatus, Heteroderes heideni.*

First record of the *Pavania carabidophila* Khaustov (Acari: Dolichocybidae) from Iran

Samaneh TASHAKOR[1], Hamidreza HAJIQANBAR[1] and Alireza SABOORI[2]
1. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran. E-mail: samanehtashakor@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir

Mites of the family Dolichocybidae are one of the families in the cohort Heterostigmatina (Acari: Prostigmata) that usually have phoretic relationships with different insects, especially beetles and ants. During a survey of phoretic mites on insects in Sistan and Baluchestan Province (eastern Iran) in 2011 and 2012, three colonies of the genus *Pavania* were collected beneath the elytra of some scarabaeid beetles namely *Rhyssemodes orientalis* Mulsant & Godart, 1875. The mite species identified as *Pavania carabidophila* Khaustov, 2005 which its record is new to the mite fauna of Iran. This species first time discovered from Ukraine phonetic on *Bembidion* sp. (Coleoptera: Carabidae), therefore host record of the family Scarabaeidae for this mite is also new.

Key words: Acari, Dolichocybidae, *Pavania,* new record, Scarabaeidae, Iran.

First report of *Eviphis ostrinus* (Koch) (Acari: Mesostigmata: Eviphididae) from Iran

Shahrooz KAZEMI[1] and Yazdanfar AHANGARAN[2]
1. Department of Biodiversity, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran. E-mail: shahroozkazemi@yahoo.com; 2. M.Sc. of Plant Protection, General Office of Natural Resources of Mazandaran Province, Nowshahr, Iran.

The family Eviphididae is a cosmopolitan predatory mite assemblage of mesostigmatans which occur in various habitats such as agricultural soils, litter, manure, vertebrate dung and nests, and sea debris, and many species are associated with scarab beetles and other arthropods, and currently includes about 130 described species in 19 genera. The genus *Eviphis* Berlese, 1903 had been reported from Iran by introducing *E. cultratellus* (Berlese, 1903) associated with scarab beetles, but this species have been transferred to its original genus, *Copriphis* Berlese, 1910 later. The genus *Eviphis* is currently monotypic with *E. ostrinus* (Koch, 1835) as its type species. In an investigation on edaphic mite fauna in North Iran in 2010, one specimen of *E. ostrinus* was collected in Dimron region, Mazandaran Province. This species usually found in soil microhabitats with high organic materials. Dorsal shield covered all dorsal idiosoma, highly doomed, peritrematal shields well continued after stigmata and fused completely or partly to metapodal platelets, hypertrophied post-stigmatic pores situated about half-way between stigmata and posterior end of peritrematal shields, sternal and epigynal shields well developed, trochanter I with five setae, genu III with seven setae, palptarsus with pair of sickle-like setae and 2-tined apotel.

Key words: Acari, Mesostigmata, Eviphididae, *Eviphis ostrinus*, Iran.

First report of the genus *Tanaupodus* (Acari: Trombidiformes: Tanaupodidae) and correction of the previous report of this family from Iran

Shima YAZDANPANAH[1], Alireza SABOORI[2], Hadi OSTOVAN[1] and Shahram HESAMI[3]
1. Department of Entomology, Science and Research Branch, Islamic Azad University, Fars, Iran; E-mail: Yazdanpanahsh@yahoo.com, Ostovan2001@yahoo.com; 2. Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: saboori@ut.ac.ir; 3. Department of Plant Protection, Shiraz Branch, Islamic Azad University, Shiraz, Iran. E-mail: s_hesami@yahoo.com

Family Tanaupodidae is one of the members of suborder Prostigmata (Trombidiformes) that are often associated with freshwater habitats. Only three species of the genus *Tanaupodus* Haller, 1882 have been described up to now. During 2010–2011, a faunistic study was conducted to collect and identify the edaphic mites associated with oak trees in Koohmare-Sorkhi region. The collected mites were misidentified as *Eothrombium*. Four deutonymphs actually represented *Tanaupodus*. This genus is a new record for the mite fauna of Iran. The mites were mounted on microscope slides using Hoyer's medium. Measurements were made under a phase contrast microscope and are given in micrometers (μm). Some of important characters of collected specimens are as follows: Naso present, some of leg setae barbed; legs with a pair of long and simple claws. Body length 19300 (from the tip of gnathosoma to posterior margin of idiosoma) and body width at the widest level of idiosoma 8800; legs length I 12800, II 9300, III 9600, IV 12400 and length of crista 3000 and also pregenital tubercle 200×200. One specimen is deposited in the Acarological Collection, Acarological Society of Iran, Karaj, Iran, one in the Acarological Collection, Jalal Afshar Zoological Museum, Karaj, Iran and two in the Acarological Collection, Department of Entomology, Science and Research Branch of Fars, Marvdasht, Iran.

Key words: Acari, Tanaupodidae, *Eothrombium*, *Tanaupodus*, Iran.

BIOCONTROL

A few morphological, biological and ethological aspects on eriophyoid mites (Acari: Prostigmata) favouring their success, with particular regard on the biological control of Invasive plants

Enrico DE LILLO
Department of Soil, Plant and Food Sciences, University of Bari Aldo Moro, via Amendola, 165/a, I-70126 Bari, Italy. E-mail: enrico.delillo@uniba.it

Eriophyoid mites are specialised plant feeders and, based on their biological and ecological characteristics, many species belonging to the Eriophyidae family have been selected as a means for the classical biological control of weeds. The main morphological (size and shape), biological (simplified life cycle, short generation time, high intrinsic rate of increase, life strategy), ecological (host plant specificity, resistance to the environmental stress conditions) and behavioural (aerial dispersal, intra-plant distribution) aspects making these mites highly effective against the weedy plants are briefly illustrated and reviewed.The main obstacles and deficiencies for a correct species identification and survey (cryptic species, biotypes, poor morphological description, suspected synonymies, occasional records, trapping and collecting procedures) are highlighted. Population dynamics, survival potential, overwintering mechanisms, laboratory and field host specificity approaches, mite adaptations to non-target host plant species and a few other aspects are discussed and analysed as challenging research topics requiring further deep investigations.

Key words: morphology, biology, ecology, behaviour, invasive host plant.

Effect of predation activity of *Neoseiulus californicus*, *Typhlodromus bagdasarjani* (Phytoseiidae) and *Scolothrips longicornis* (Thripidae) on population density of adult females of two-spotted spider mite under microcosm conditions

Azadeh FARAZMAND, Yaghoub FATHIPOUR and Karim KAMALI
Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, P. O. Box 14115-336, Tehran, Iran. E-mail: farazmand@modares.ac.ir

The effects of predator combinations on two-spotted spider mite were investigated in a microcosm system. The microcosm experiments were run for 15 days and consisted of one cucumber plant with four leaves enclosed in a transparent plastic cylinder (20 cm diameter × 42 cm height) covered at top with a fine mesh to allow ventilation and were placed individually in greenhouse room (26˚C, 65% RH and a photoperiod of 16h light: 8h dark). The treatments were included 20 two-spotted spider mites (TSSM) (*Tetranychus urticae*) as a control, 10 predatory mites and 20 TSSM (*Neoseiulus californicus* and *T. urticae*), 10 predatory mites and 20 TSSM (*Typhlodromus bagdasarjani* and *T. urticae*),10 predatory thrips and 20 TSSM (*Scolothrips longicornis* and *T. urticae*), 20 predatory mites and 20 TSSM (*N. californicus* , *T. bagdasarjani* and *T. urticae*), 10 predatory mites, 10 predatory thrips and 20 TSSM (*N. californicus*, *S. longicornis* and *T. urticae*), 10 predatory mites, 10 predatory thrips and 20 TSSM (*T. bagdasarjani* , *S. longicornis* and *T. urticae*), 20 predatory mites, 10 predatory thrips and 20 TSSM (*N. californicus*, *T. bagdasarjani, S. longicornis* and *T. urticae*). At the end of each experiment, the cucumber leaves were cut and adult females of TSSM were counted. The results showed significant difference between the control and other treatments. The average number of adult females of *T. urticae* was 70.6 for control treatment. In the treatment of 10 predatory mite, 10 predatory thrips and 20 TSSM (*N. californicus*, *S. longicornis* and *T. urticae*), the population density of TSSM was 15. Also, no additive or synergistic effect between predators in reduction of TSSM population was observed. Therefore, the microcosm set up proved to be an appropriate tool to investigate intraguild predation and interactions between predators and two-spotted spider mites.

Key words: Microcosm*, Neoseiulus californicus*, *Typhlodromus bagdasarjani*, *Scolothrips longicornis, Tetranychus urticae.*

Mites as potential pests and predators of ornamental and floricultural plants in West Bengal, India

Soma KARMAKAR and Salil K. GUPTA
Medicinal Plants Research Unit, Ramakrishna Mission, Narendrapur, Kolkata-700103, India

Flowers in India have immense values in social, cultural, aesthetic and religious lives of Indian people. Ornamental and floricultural plants have recently become viable business in India including West Bengal. This sector is also helping women empowerment as many women are involved in this trade. West Bengal is one of the leading states of India in production of flowers and leafy ornamentals and these are extensively grown in home gardens, community parks and also in large scale commercially in various gardens. Unfortunately, this enterprise is receiving severe threats from attack of mite pests causing substantial economic loss to the growers. Therefore, with a view to studying the occurrence of pest and predatory mites on these plants, their identities, record observation regarding their host range, nature of damage, period of occurrence, etc. in West Bengal, this topic of research was undertaken in South Bengal during 2009–2012 and the results of the same are presented in this communication. As many as 26 types of ornamental and floricultural plants growing in South Bengal covering 9 districts were surveyed during 2009–2012 and that yielded a total of 32 species belonging to 16 genera under 8 families. Among these, 17 species belonging to 4 families and 8 genera were phytophagous, 14 species under 3 families, 7 genera were predatory and 1 belonged to fungivorous group. The most important and abundantly available mite pests which were encountered were (1) *Tetranychus urticae* on rose, chrysanthemum, zinnia, carnation, tuber rose, marigold, dahlia, sunflower, gladiolus and Gardenia florida; (2) *Tetranychus neocaledonicus* on jasmine, rose, geranium; (3) *Eutetranychus orientalis* on rose, bougainvillea, sunflower; (4) *Tetranychus ludeni* on cosmos, marigold; (5) *Breviplalpus phoenicis* on rose, china rose, sunflower, gerbera (6) *Brevipalpus californicus* on oleander, china rose, queen of the night, (7) *Aceria jasmini* on jasmine and (8) *Polyphagotarsonemus latus* on marigold, tulip. The other phytophagous mites like *Bryobia eharai* and *Brevipalpus karachiensis* on chrysanthemum and *Tetranychus macfarlanei* on golden champa were encountered only occasionally. Among the predatory mites, those like *Amblyseius largoensis*, *Neoseiulus longispinosus*, *Euseious ovalis*, *Euseius alstoniae*, *Euseius coccineae* and *Paraphytoseius multidentatus* all belonging to Phytoseiidae were found to be most abundant, agile and had shown promise as effective predators on various stages of prey mites. The occurrence of other predatory mites belonging to Phytoseiidae, Stigmaeidae, Anystidae etc. as well as other members of phytophaguos mites was only casual.

Key words: mites, diversity, floricultural plants, ornamental plants, West Bengal, India.

Biological traits of *Phytoseius plumifer* (Acari: Phytoseiidae) fed on *Rhyncaphytopus ficifoliae* (Acari: Diptilomiopidae) at laboratory condition

Mojdeh LOUNI, Shahriar JAFARI and Jahanshir SHAKARAMI
Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: Jafari.s@lu.ac.ir

Rhyncaphytopus ficifoliae Keifer is one of the most important pests of fig trees in western Iran. *Phytoseius plumifer* Canestrini & Fanzago is a generalist predator of *R. ficifoliae* on fig trees and can be prevent the outbreak of spider mites and *R. ficifoliae*. The life history and predation rate of *P. plumifer*, fed on the *R. ficifoliae* was studied under laboratory conditions at 25±1°C, 65 ±5% relative humidity and 12:12 h (L:D) photoperiod. The results demonstrated that *P. plumifer* can be developed fed on adult stage of *R. ficifoliae*. The developmental time of egg, larva, protonymph, deutonymph and all immature stages was 1.94, 1.12, 2.71, 2.92 and 8.73 days, respectively. The egg hatching rate and the survival rate of immature stages were 100%. Total prey consumption by larva, protonymph, deutonymph and adult female was 3.90, 13.13, 18.46 and 26.70 individuals, respectively. The average adult female longevity and life span were 39.34 and 48.07 days, respectively. The sex ratio was 65% (females/ females+ males). The intrinsic rate of increase (r_m) and the net reproductive rate (R_0) were 0.15 day^{-1} and 17.99 female offspring, respectively. Our findings showed that *P. plumifer* is an indigenous biological agent can be helpful to the control of *R. ficifoliae* on fig trees.

Key words: Demographic parameters, *Phytoseius plumifer*, *Rhyncaphytopus ficifoliae*, fig.

Intraguild predation among the predatory mites *Neoseiulus barkeri*, *Phytoseiulus persimilis* and *Amblyseius swirskii*: natural enemies of the two spotted spider mite

Bahador MALEKNIA and Yaghoub FATHIPOUR
Department of Entomology, Faculty of Agricultural, Tarbiat Modares University, Tehran, Iran. E-mail: B.maleknia@yahoo.com

Intraguild predation is apparent when two species feed on the same prey and therefore may predate each other, and is a widespread phenomenon among arthropod food webs. It is necessary to understand any interaction among the naturally occurring, knowledge of trophic interaction within and among predator species is important to understand predator-prey and predator-predator dynamics, and to predict the impact of predators in natural and biological control of herbivorous arthropod pests. In this study intraguild predation of adult female and immature stages of the generalist phytoseiid mites, *Amblyseius swirskii* (Athias-Henriot), *Neoseiulus barkeri* (Hughes) and *Phytoseiulus persimilis* Athias-Henriot was studied under laboratory condition in absence or presence of extraguild prey. Adult female of three predators exhibited higher predation rate on larvae than on eggs, protonymphs and deutonymphs respectively (P=0.0001). *Phytoseiulus persimilis* was not able to feed on larval stages of other two phytoseiids. However, *A. swirskii* and *N. barkeri* fed on eggs, larvae, protonymphs and deutonymphs of heterospecific predator. Females of *A. swirskii* consumed more phytoseiid larvae (3.56 *N. barkeri*, 4.23 *P. persimilis* per day) than other species and this mite is intraguild predator in our experiments. In presence of *Tetranychus urticae* Koch as extraguild prey, intensity of IGP among phytoseiied species in all experimental patches reduced significantly (F= 99.68, df= 11,192, P= 0.0001). Interactions among *A. swirskii*, *N. barkeri* and *P. persimilis* are discussed in relation to their effectiveness as biological control agents in the greenhouse and the natural control of spider mite in the field.

Key words: Intraguild predation, Competitor, Interaction, Predatory mite.

Intraguild predation among one non-native and two native phytoseiid predators of Iran in the presence of *Tetranychus urticae*

Aliakbar DANESHMANDI[1], Hasan RAHMANI[1], Andreas WALZER[2] and Mahdi JALAEIAN[3]
1. Department of Plant Protection, Faculty of Agriculture, Zanjan University, Zanjan, Iran. 2. Group of Arthropod Ecology and Behavior, Division of Plant Protection, Department of Crop Sciences, University of Natural Resources and Life Sciences, Peter Jordan Strasse 82, 1190 Vienna, Austria. 3. Department of Plant Protection, Rice Research Institute of Iran (RRII), Rasht, Iran. E-mail: Rahmani_hsn@yahoo.com

Intraguild predation (IGP) contains elements of competition and predation, whereby the competitors can kill each other. The non-native predatory mite *Neoseiulus californicus* and two native predatory mites *Typhlodromus bagdasarjani* and *Phytoseius plumifer* are considered as appropriate candidates for controlling spider mites in greenhouses and they might be applied at the same time to boost the control effect on the two spotted spider mite *Tetranychus urticae*. Consequently, they are food competitors and potential IGP among the three predator species can mitigate or interrupt the biological control success of the predators on the spider mites. Thus, we checked the ability of the three predatory mite species to prey on larvae of each other [the intraguild (IG) prey] in the presence of the extraguild (EG) prey *Tetranychus urticae*. Adult females of each predatory species were individually placed into closeable cages and were provided with 6 larvae per IG prey species (IG prey), and 12 immatures of *T. urticae* (EG prey) over 4 days. At each day the cages were checked every 30 min. over a period of 480 min for the first attack on IG or EG prey. Predation rates were recorded every 24 h. All three predators preferred to attack EG prey at first and also consumed more EG than IG prey. Females of *N. californicus* attacked significantly faster EG than IG prey larvae, whereas the attack times on IG and EG prey larvae were non-significant for *T. bagdasarjani* and *P. plumifer* females. The predator species had no influence on the consumption rates and attack times on the IG prey larvae. Hence based on these preliminary results, IGP among the three predatory mite species seems to be low in the presence of the EG prey, however, further experiments are needed to evaluate the effects of IGP among the three species on population level.

Key words: Intraguild predation, *Neoseiulus californicus*, *Typhlodromus bagdasarjani, Phytoseius plumifer*.

Spatial distribution and seasonal activity of two phytophagous mites and its natural predator in an unsprayed apple orchard of Khorramabad, Western Iran

Mojtaba RAHMATI[1], Shahriar JAFARI[2], Katayoon Kheradmand[1] and Mohammad Bagheri[3]
1. Department of Plant Protection, Aboureihan campus, University of Tehran, Tehran, Iran. E-mail: mrahmati65@ut.ac.ir; 2. Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: Jafari.s@lu.ac.ir; 3. Department of Plant Protection, Faculty of Agriculture, Maragheh University, Maragheh, Iran. E-mail: mbagheri20022002@yahoo.com

The spatial distribution and population fluctuation of two phytophagous mites *Tetranychus urticae* Koch and *Cenopalpus pulcher* (Canestrini and Fanzago) and their predator *Typhlodromus bagdasarjani* Wainstein & Arutunjan were studied in an unsprayed apple orchard of Chaghalvandi region (Lorestan Province, Iran) during 2012. The spatial distribution was determined by using Taylor's power law, Iwao's patchiness regression and mean to variance ratio methods. Calculated RV and reliable sample size for the 25% variation from preliminary sampling for *T. urticae* were 16.22% and 53.86, respectively. The results demonstrated that *T. urticae* and *T. bagdasarjani* have two peaks in population density but *C. pulcher* has one peak and the high population of mentioned species observed at on 23th August, 11th August and on 11th September, respectively. The slopes of Taylor's power law and Iwao's patchiness regression methods were significantly with one exception greater than one that indicating aggregated spatial distribution in two preys and its predator. Our finding presented a significant and positive correlation between population fluctuations of two phytophagous mites and predator that indicated a density dependent reaction of predator to the prey's densities. Investigation of the correlation value and relation between meteorological parameters with three mentioned mite's population showed was not significant effect. Knowledge of the distribution and seasonal changes in the control management planning of pests and protection of indigenous populations of natural enemies can be very helpful.

Key words: Spatial distribution pattern, population density, *Typhlodromus bagdasarjani*, *Cenopalpus pulcher*, *Tetranychus urticae*.

Non-target effects of three isolates of the entomopathogenic fungus *Beauveria bassiana* on *Phytoseiulus persimilis* (Acari: Phytoseiidae)

Marjan SEIEDY
Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran. E-mail: mseyyedi @ut.ac.ir

The intensive use of insecticides and acaricides has led to resistance in many mite species around the globe. The phytoseiid mite, *Phytoseiulus persimilis* (Acari: Phytoseiidae), is a specialist predator of tetranychid mites and the most frequent used biological control agent for *Tetranychus urticae* Koch (Acari: Tetranychidae). The use of entomopathogens to control certain pests may be a future alternative for solving problems of chemical resistance and environmental contamination, thereby improving the economical and biological sustainability of this agroecosystem. *Beauveria bassiana* (Balsamo) Vuillemin is one of the major fungal entomopathogens. Susceptibility of female adults of *Phytoseiulus persimilis* was tested by direct effect three isolates of *B. bassiana* (EUT105, EUT116, DEBI008) that had the same group in LC50 for T. urticae from four of isolates of *B. bassiana* (PTTC, EUT105, EUT116, DEBI008). These isolates of fungus were screened against *P. persimilis* in 8 replicates, 1 concentration bioassay (1×106 conidia/ml). Another investigations were carried out on indirect effects of strain DEBI008 of *B. bassiana* on the predatory mite *P. persimilis*. Four time intervals; 0, 24, 48 and 72-h post-inoculation of cucumber leaf discs were considered for introducing predator. 30 replicates were conducted for each time intervals. Effects of direct and indirect sprays of conidia of *Beauveria bassiana* on mortality of *Phytoseiulus persimilis* adult were analyzed using GLM procedure in SAS software and comparison means were done by the F-LSD test. *Phytoseiulus persimilis* adults were highly susceptible to isolates EUT105, EUT116 in direct effect experiment. In related to second experiment, we found that there was not a significant difference in viability of predatory mite on these treatments. Further knowledge is needed to adjust timing of various releases of both biological control agents to obtain maximum additive effectiveness in the field with minimum impact of the fungus on the predator.

Key words: *Beauveria bassiana*, *Tetranychus urticae*, Mortality, concentrations, *Phytoseiulus persimilis.*

Virulence of entomopathogenic fungus *Beauveria bassiana* against the European red mite, *Panonychus ulmi* (Koch) (Acari: Tetranychidae)

Atie SHEMSHADIAN [1], Reza TALAEI-HASSANLOUI[1], Azadeh ZAHEDI-GOLPAYEGANI [1] and Marjan SEIEDY[2]

1. Department of Plant Protection, College of Agriculture and Natural Resources, University of Tehran, Karaj, 31587-77871, Iran. E-mail: ashemshadian@ut.ac.ir; 2. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

The European red mite, *Panonychus ulmi* is a major pest in almost all fruit growing regions of our country and the world. *Panonychus ulmi* has wide host range includes deciduous bushes and trees belonging to the family Rosaceae, but it is in association with fruit trees such as apple, pear, plum, peach, prune and cherry that it reaches economic importance. Virulence of two isolates of entomopathogenic fungus *Beauveria bassiana* was investigated on the *P. ulmi* under laboratory conditions at 26 ± 1º C, 65 ± 5% R.H. and 16:8 (L:D). It was also determined whether the fungal infection can affect the survival of the European red mite adults. Analysis of data for different concentrations of conidia (1×10^2, 1×10^3, 1×10^4, 1×10^5, 1×10^6, 1×10^7 and 1×10^8 conidia/ml) indicated that the mean mortalities for isolate EUT105 were 3.3, 26.6, 70.8, 75.8, 80, 85 and 95.8%, respectively. The corresponding values for isolate AIR4 were 8.3, 48.3, 75, 85.8, 85.8, 90 and 95% at 10^2 to 10^8 conidia/ml, respectively. Our results showed that there is no significant difference between two isolates ($P > 0.05$). Probit analysis revealed that the amount rates of LC_{50} belonging to the isolates EUT105 and AIR4 were 6.8×10^3 and 1.6×10^3 conidia/ml, respectively. The LC_{50} values were not significantly varied between the two isolates considering their lethal dose ratio. The results show that these two isolates are promising candidates for microbial control of European red mite.

Key words: *Neoseiulus californicus, Panonychus ulmi, Beauveria bassiana,* virulance

The effect of separate use of *Neoseiulus cucumeris* Oudemans (Acari: Phytoseiidae) and acaricide and their integrated in control of two spotted spider mite *Tetranychus urticae* Koch (Acari: Tetranychidae) on strawberry in greenhouse conditions

Farzaneh SOROURI, Bijan HATAMI, Alireza JALALIZAND and Mehrdad JAFAR POUR

Department of Entomology, College of Agriculture, Khorasgan (Isfahan) Branch, Islamic Azad University, Iran. E-mails: farzanehsorouri@yahoo.com, bhatami30@yahoo.com, arjalalizand@yahoo.com, jafarpour@khuisf.ac.ir

Neoseiulus cucumeris Oudemans (Acari: Phytoseiidae) is known throughout the world as a generalist predator of small insects and mites. This experiment was conducted in 4 treatments including the separate use of predatory mite, Hexythiazox (acaricide), the integrated use predatory mite and acaricide and control. Each treatment was replicated faur times. Live spider mites were counted three, seven, 14 and 21 days after release of predators and spraying acaricide. The results showed that the effect of separate use of acaricide to control spider mite was less efficient in long time. While the separate use of predatory mite and integrated use of predator and acaricide controlled effectively the spider mite. The percentage mortality of the spider mite after 21days of release time and spraying acaricide were estimated to be 96.3% and 97.1% for separate use of predatory mite and integrated use of predator and acaricide, respectively. Since, the percent of mortality of predatory mite and integrated control were almost similar, therefore the separate use of predatory mite is recommended. However, to effectively control the spider mite, when its population is high, it would be better to bring down the pest population with an appropriate acaricide, then the predator is released.

Key words: *Neoseiulus cucumeris*, acaricide, *Tetranychus urticae*, chemical and biological method, strawberry.

The release ratio of *Neoseiulus cucumeris* Oudemans (Acari: Phytoseiidae) to control two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) on strawberry in greenhouse conditions

Farzaneh SOROURI, Bijan HATAMI, Alireza JALALIZAND and Mehrdad JAFAR POUR
Department of Entomology, College of Agriculture, Khorasgan (Isfahan) Branch, Islamic Azad University, Iran. E-mails: farzanehsorouri@yahoo.com, bhatami30@yahoo.com, arjalalizand@yahoo.com, jafarpour@khuisf.ac.ir

Neoseiulus cucumeris Oudemans (Acari: Phytoseiidae) is known throughout the world and it is a generalist predator that feeds on pollen, small insects and mites. In this study, the release ratios of the predatory mite on spider mite of strawberry plant in greenhouse conditions were determined. The experiment was conducted in 4 treatments including the release ratios of 1:5, 1:10 and 1:15 (predator: prey), and control treatment, each in 4 replications. Three, 7, 14 and 21 days after release of predators, live spider mite and predators were counted. The results showed that the spider mites could be controlled effectively using predatory mite. Furthermore, after 14 and 21 days, the differences between all treatments were significantly different at 1% level. Although the rate of mortality of spider mite in 1:5 and 1:10 (predator: prey) were similar, in view point of economic the ratio of 1:10 is recommended.

Key words: *Neoseiulus cucumeris*, spider mite, *Tetranychus urticae*, release ratio, strawberry.

BIOLOGY, ECOLOGY & ETHOLOGY

Influence of feeding on different pollens on biology of *Euseius finlandicus* (Oudemans) (Acari: Phytoseiidae)

Roghaye BARZEGARI[1], Davood SHIRDEL[2] and Mohammad JAFARLOO[2]
1. Department of Plant Protection, Faculty of Agriculture, Islamic Azad University, Tabriz Branch, Tabriz, Iran. E-mail: barzegari_r@yahoo.com; 2. Agricultural and Natural Resources Research Centre of East Azarbaijan, Tabriz, Iran.

The predatory mite, *Euseius finlandicus*, can feed and reproduce on many diets such as pollens. In this research, influence of feeding on corn, palm, rose and walnut pollens on some biological characteristics of the predatory mite was studied and compared as four different diets treatments in a complete randomized design (CRD). Mites were kept individually on some black mulberry leaf discs at 24±2 °C temperature, 60±5 % relative humidity and a photoperiod of 16:8 (L:D) hours, with a sufficient quantity of the pollens. Results showed that *E. finlandicus* could develop and reproduce when the predatory mite fed on the all of diets. The mean of developmental time from egg to adult emergence varied between the treatments from 6.65 to 7.85 days for females. The minimum and maximum mean of developmental time of females were on palm and rose pollens respectively. The mean of longevity varied between the treatments. It had minimum amount for females on rose and corn pollens and it was maximum on walnut and palm pollens. The minimum and maximum mean of longevity of males were on palm and corn pollens respectively. Also the maximum mean of total fecundity (21.30 eggs/female) was on palm pollen. The minimum mean of this parameter (12.00 eggs/female) was on corn pollen. Survival percent of immature stages was maximum (82.76 %) on palm pollen. It was minimum (68.18 %) on corn pollen. According to these results, palm and walnut pollens were more suitable diets for *E. finlandicus* in comparison to rose and corn pollens.

Key words: Phytoseiidae, *Euseius finlandicus*, pollen, biology.

Hyperphoresy, a rarely observed behaviour in mites

Gholamreza BEYZAVI
Beyzavi.reza@yahoo.com

The term phoresy was introduced by Lesne, 1896. Phoresy is very common in the animal kingdom, however it is developed above all in those taxa in which the organisms are limited in their movement by absence of legs or wings and are living under rapidly changing environmental conditions. In mites only one stage shows a tendency for phoretic dispersal, either the deutonymphs or the adult females. Hyperphoresy involves a situation where a phoretic mite is carried by an animal that itself is also carried by another animal. During my research in oak forests of Fars Province, Iran, adults of *Propomacrus bimucronatus* Pallas, 1781 (Col: Scarabaeidae) and their larvae were collected from a hole in an oak tree trunk. This insect is actually one of the pests of oak forests in Iran and also lives in Cyprus, Greece, Israel, Syria, Turkey and Yugoslavia. The phoretic mites on the body of the adult beetles exhibit different ways of attachment: On the ventral side of the beetles, at anterior margin of prosternum and also in the suture between coxae I, four different species of mites observed: *Dendrolaelaps* sp. (Digamasellidae: Deutonymph); *Urobovella* sp. (Uropodidae: Deutonymph); *Promacrolaelaps propomacrus* Joharchi, Halliday & Beyzavi, 2013 (Laelapidae: Female) and *Sancassania* sp. (Acaridae: Deutonymph). Hypopi of *Sancassania* sp. were attached in the deepest part of suture in the middle of coxa I, *Dendrolaelaps* specimens covered them and a large colony of *P. propomacrus* covered the digamasellids. *Urobovella* sp. were attached irregularly on the sternum of thorax. One of the laelapids on the dorsolateral area of the body carried a single deutonymph of *Urobovella* sp. which may therefore represents a case of hyperphoresy. However, more research is needed to test the phoretic relationship of these species.

Key words: Hyperphoresy, mite, Laelapidae, Uropodidae.

A new case of phoresy in free-living cheyletid mites

Gholamreza BEYZAVI
Beyzavi.reza@yahoo.com

Cheyletids are literally everywhere for example in plant residue, the soil surface layer, burrows of small mammals, nest of insects, anthills, tree crowns, bird nests, warehouses and skin of mammals and birds. These mites require phoresy for dispersal. It is interesting that the premaginal phases of entomophil cheyletid mites have never been detected on the insects (except *Pavlovskicheyla platydemae* Thewke & Enns, 1975 which is unique among entomophilous cheyletids). In some predatory cheyletid genera like *Cheyletia*, *Hypopicheyla* and *Samsinakia* insect association is very specialized and characters of body are obviously modified to phoresy on insects, and in some genera like *Cheletomorpha* and *Neochelacheles* phoresy is common but is not obligate. The visual searching for finding the insects and their associated mites in the surrounding of cow barns in Fars Province of Iran, showed a new case of phoresy between *Lepidocheyla gracilis* Volgin, 1963 and unidentified beetles. Two different parts on the insect bodies were used by adult females of the mite. In the first one, a female was attached in center of pronotum in dorsal view, and in the other one, a female was attached in the sternum of thorax between coxae of leg II. The mites were clearly attached to the insect body sites by anal pedicel. To be more certain, the mites were removed from insects and after clearing were examined. The anal pedicel diameter increased slightly in length, looked like an upside down funnel and was stuck to beetles body. This form of phoresy had not been reported before. Furthermore, presence of *L. gracilis* in the colony of *Cheletomimus* (*Hemicheyletia*) *vescus* Qayyum & Chaudhri, 1979 and the high similarities between these two mites, made me to be in doubt that whether *L. gracilis* is a phoretic form of females of *C.* (*H.*) *vescus*. Its acceptance needs further study in this respect.

Key words: Cheyletidae, phoresy, *Lepidocheyla*.

The effect of rearing conditions on the olfactory responses of *Amblyseius swirskii* (Athias-Henriot) (Acari: Phytoseiidae)

Mehdi BOHLOOLZADEH, Esmaeil BABAEIAN, Fereshteh KARAMI, Sepideh ASGARIEH, Helen MOHAMMADI and Azadeh ZAHEDI GOLPAYEGANI
Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. Email: bohloolzadeh@ut.ac.ir

The response of predatory mites to herbivore induced plant volatiles depends on several factors such as their rearing conditions. We studied the effect of rearing conditions on the olfactory response of the predatory mite, *Amblyseius swirskii* when receiving odors from spider mite infested bean leaves vs. clean bean leaves. Predators were reared in two conditions: (1) artificial arena, consisting of a plastic sheet with a mass of bean leaves on, put on a water-saturated sponge, and (2) detached leaf cultures, consisting of same-aged bean leaves with the same sizes put upside down on a water-saturated cotton layer in Petri dishes. Predators were introduced to the arenas two months prior to the experiments. Same-aged *A. swirskii* were used for the olfactory tests. We used a Y-shaped olfactometer, equipped with hotwire flowmeters. Data analysis was performed by G-test. For the predators reared on artificial arena, no significant difference was observed between the number of *A. swirskii* moving towards clean leaves (41.6%) and the ones that preferred volatiles of infested leaves (58.3%) ($P > 0.05$). For the predators reared on detached bean leaves, the number of *A. swirskii* moving towards spider mite infested leaves was significantly higher (81.9%) than the number of predators moving towards clean leaves (18.1%) ($P < 0.05$). Our results demonstrate that the rearing conditions of *A. swirskii* females could affect their olfactory responses. Further investigations are needed to identify the effect of rearing conditions on more complex behaviors of *A. swirskii.*

Key words: volatile, rearing condition, olfactometer, behavior, *Amblyseius swirskii.*

Mating experience affects mating efficiency in *Phytoseiulus persimilis* (Acari: Phytoseiidae)

Hamideh DEHGHANI TAFTI, Azadeh ZAHEDI GOLPAYEGANI and Alireza SABOORI
Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mails: h_dehghani@ut.ac.ir, dehghanyh@yahoo.com, zahedig@ut.ac.ir, saboori@ut.ac.ir

Studies have shown that previous experience in mating can affect the time and frequency of mating. Here we studied whether *Phytoseiulus persimilis* Athias-Henriot males that were naïve or had copulated with females from the same line, differred in mating efficiency. We used same-aged male *P. persimilis* from a given line in controlled conditions (25± 2°C, 65± 5% RH and 16:8 h L:D photoperiod). From each pair of same aged predators, one was put on a spider-mite infested bean leaf disc (1.7× 1.7 cm^2) without other predators, and another was inserted in a similar Petri dish with three same aged female predators from the same line for 24 hours. We monitored the second Petri dish until the first mating took place. Afterwards, both male predators were transferred to a Petri dish with a female *P. persimilis* from the same line, until one of them started mating. The state of the male (naïve or experienced, with different color spots) which started mating was recorded (N=24). We analyzed the data through binomial non parametric test in SPSS 16. Our results showed that *P. persimilis* males with no previous experience of mating were the first (sometimes the first and the last) who mated with the females ($P< 0.01$). The effect of previous mating experience on male mating efficiency needs further investigations.

Key words: mating, experience, *P. persimilis*.

The effect of kinship on mating preference: Does *Phytoseiulus persimilis* avoid mating with kin?

Hamideh DEHGHANI TAFTI, Azadeh ZAHEDI GOLPAYEGANI and Alireza SABOORI
Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mails: h_dehghani@ut.ac.ir, dehghanyh@yahoo.com, zahedig@ut.ac.ir, saboori@ut.ac.ir

Previous studies have shown that inbreeding would affect *Phytoseiulus persimilis* Athias-Henriot fitness in that a considerable number of eggs do not hatch. Hence, we expect predators to recognize and avoid mating with kin. Here, we have studied whether *P. persimilis* females can discriminate between males based on the degree of relatedness. We prepared two different lines from our main culture of *P. persimilis*. The lines were kept under controlled conditions (25± 2°C, 65± 5% RH and 16:8 h L: D photoperiod). One female predator (with no previous experience of mating) was placed in a Petri dish (6 cm in diameter), together with two same aged *P. persimilis* males, one related to the female being from the same line and the other being from another line (marked with water color). The behaviour of the two males were monitored for six hours. The state of the male who mated first was recorded. Twenty replicates were carried out. We analyzed the data by means of a binomial non-parametric test in SPSS 16. Our results showed that the number of non-kin males who mated with the female first, did not differ from the kin ones who mated first ($P< 0.05$). It seems that *P. persimilis* is not able to adjust its mating preference according to kinship. The effect of variable ranges of kinship (e.g. males related to one female or males from different females but related to a same line, etc.) on *P. persimilis* mating behavior needs further investigation.

Key words: mating, *Phytoseiulus persimilis*, kinship, experience.

The effect of territory on *Phytoseiulus persimilis* (Acari: Phytoseiidae) mating combat

Hamideh DEHGHANI TAFTI, Azadeh ZAHEDI GOLPAYEGANI and Alireza SABOORI
Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mails: h_dehghani@ut.ac.ir, dehghanyh@yahoo.com, zahedig@ut.ac.ir, saboori@ut.ac.ir

Several factors could affect the predatory mite mating behavior. Previous studies have shown that males of *Phytoseiulus persimilis* often provide a territory for themselves and forbid other competitor male entrance to it. Here we have studied, whether the males of *P. persimilis* could recognize the conspicuous male which is not related to its territory and put a hold on its mating with the only female predator on the patch. A male of predator (with no previous experience of mating) was introduced into a Petri dish (6 cm in diameter) on a bean leaf square (1.7× 1.7 cm^2) that infested with spider mite for eight hours. A female of *P. persimilis* was added to the same leaf square for one hour. Care was taken to avoid them start mating. The experiment was started by introducing another male of *P. persimilis* to the square. The males were colored by different water colors. We monitored the leaf squares for eight hours to find out which male would mate sooner.Twenty replicates were considered in controlled conditions (25± 2°C, 65± 5% RH and 16:8 h L:D photoperiod). We analyzed the data through binomial non parametric test in SPSS 16. Our results showed no significant difference between the number of first and second males who mated with *P. persimilis* female first (P> 0.05). As the predators which we tested were related to a same line, it will be worthy to study the effect of both kinship and territoriality on the male mating behavior.

Key words: territory, mating, *Phytoseiulus persimilis,* conspicuous.

Biology of *Trisetacus ehmanni* (Keifer) (Prostigmata: Eriophyoidea: Phytoptidae) on pine tree, *Pinus eldarica* Tenore in Mashhad city

Maryam GHAREZADEH[1], Hashem KAMALI[2] and Ehssan TORABI[3]
1. Graduated student, Entomology Department, Islamic Azad University, Tabriz Branch, P. O. Box 51575-5114, Tabriz, Iran. E-mail: m.gharezade@yahoo.com; 2. Agricultural and Natural Resources Research Center of Khorasan Razavi, Mashhad, Iran. E-mail: hashemkamali@gmail.com; 3. Department of Plant Protection, College of Agricultural and Natural Resources, University of Tehran, Karaj, Iran.

Eriophyoid mites are entirely phytophagous. Most of them look for microenvironments in which to live, feed and reproduce. Several different species of *Trisetacus* genus exist on *Pinus elderica* Tenore, *Pinus pinea* L., *Pinus nigra* J.F. Arnold and *Pinus mugo* Turra. (Pinacae). They feed within needle sheaths and causes chlorosis, stunting and needle distortion. The biology of *Trisetacus ehmanni* was studied on pine trees in the Mashhad environment conditions. A two factor experiment based on CRD with three replicate was conducted. Each experimental unit consisted of ten branches of each tree, selected randomly, from which mites were extracted. Eggs, nymphs, females and males were counted on each branch. Sampling was continued every two days in the four seasons. The impact of different ranges of relative humidity (RH%) and environment temperature in Mashhad city were studied on mite biology, size and duration of each developmental stage. Annual monitoring showed that the *Trisetacus ehmanni* has four generations per year. Overwintering form were female and nymphs in the sheath covering the base of the leaf pine. The effect of both factors and their interaction on population of eggs, nymphs and females were significant (P< 0.01). The highest and lowest sex ratio were determined 3/4 and 1/11 respectively. There was no egg in the temperature range 0–5 °C. The maximum number of eggs and nymphs were observed in 15–20 °C and 20–25 °C ranges, respectively and 30 RH%. The lowest number of eggs and nymphs were observed in the 0–5 °C range and 40 RH%. The highest number of females was observed in the 15–20°C rage and 30 RH% and the lowest in the 0–5 °C and 60 RH%. The maximum and minimum observed females length were 188 and 107 micrometer in 50 and 60 RH%, respectively. Approximately the first half of the year, predatory mite *Phytoseiulus*, *Amblyseius* and *Neoseiulus* genera, six-spotted thrips, *Scolothrips sexmaculatus* were fed all pest mite stages. Among the several types of pine trees, *Trisetacus ehmanni* was seen only on *Pinus elderica*. Evaluation of mite development stages in several constant temperatures in the laboratory conditions to determine the lower and upper threshold temperature will give a suitable forecasting model in integrated pest management program.

Key words: *Trisetacus*, *Pinus*, Biology, Mashhad.

Intraguild predator aggressiveness towards its heterospecific larvae

Somayeh HAGHANI, Azadeh ZAHEDI GOLPAYEGANI, Alireza SABOORI and Hossein ALLAHYARI

Department of Plant protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: haghani.somayeh86@gmail.com, zahedig@ut.ac.ir, saboori@ut.ac.ir, allahyar@ut.ac.ir

Aggressiveness of adult female predatory mites towards other species of predatory mites was quantified as the time needed to attack and kill heterospecific larvae. Here, we have studied whether the aggressiveness of *Amblyseius swirskii* Athias-Henriot adult female towards *Phytoseiulus persimilis* Athias-Henriot larvae would differ from that of *Phytoseiulus persimilis* adult females towards *Amblyseius swirski* larvae. This was also checked between *Neoseiulus californicus* McGregor and *Phytoseiulus persimilis.* The predator combinations were introduced to 9 cm Petri dishes with same sized bean leaves put upside down on water saturated cotton. The cotton was also envelopped the leaf edges in order to keep the leaf fresh and provide water for the predators. The searching predator females were kept starved for 16 hours prior to the experiment. The experiments were started by introducing a heterospecific larva to the leaf disc containing a starved female predator. Twenty replicates were carried out for each treatment. The Petri dishes were kept under controlled conditions (25± 2ºC, 60±5% RH and 16:8h L:D photoperiod). Data was analyzed through Student t-tests in SPSS 16. Our results showed that *A. swirskii* adult females successfully attacked within 20.55 ± 2.64(SE) minutes towards *P. persimilis* larvae which is significantly lower than the time *P. persimilis* females needed for performing their first successful attack (164.95±14 minutes)($P< 0.01$). The mean estimated attack time of *N. californicus* towards *P. persimilis larvae* was estimated to be 42.55±7.28 minutes which is significantly lower than that of *P. persimilis* females towards *N. californicus* larvae (209.9±24 minutes) ($P< 0.01$). Both *A. swirskii* and *N. californicus* were considered more aggressive than *P. persimilis*.

Key words: Aggressiveness, heterospecific, *Phytoseiulus persimilis*, *Amblyseius swirskii*, *Neoseiulus californicus.*

Comparative reproductive performance of *Neoseiulus barkeri* Hughes (Acari: Phytoseiidae) at seven constant temperatures fed on two-spotted spider mite

Shahriar JAFARI[1], Yaghoub FATHIPOUR[2] and Farid FARAJI[3]

1. Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: Jafari.s@lu.ac.ir; 2. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, P.O. Box 14115-336, Tehran, Iran. 3. MITOX Consultants, P.O. Box 92260, 1090 AG Amsterdam, The Netherlands.

The effect of seven constant temperatures of 15, 20, 25, 27, 30, 35 and 37 °C on reproductive performance of *Neoseiulus barkeri* were determined in laboratory conditions under 65 ± 5 % RH and a photoperiod of 12: 12 (L: D) h on nymphal stages of *Tetranychus urticae* Koch. To accomplish the experiment, a cohort of 50 same-aged eggs of *N. barkeri* was used at each temperature tested. The predatory stages of *N. barkeri* were provided daily with sufficient nymphs of *T. urticae* for feeding. The experimental units were monitored daily and any changes recorded until the death of the last female. This monitoring allowed us to determine pre-oviposition, oviposition and post-oviposition periods, female longevity, fecundity and survival rate of both immature and adult stages. The highest value of gross fecundity was at 27 °C (40.54 eggs/ female), whereas the lowest value of this parameter was observed at 15 °C (21.38 eggs/ female). The gross fertility rate was the highest at 27 ºC (40.54 eggs/ female) and lowest at 15 °C (19.67 eggs/ female). The net fecundity rate varied from 14.61 (at 15 °C) to 37.53 eggs (at 27 °C). The net fertility rate was the highest at 27 °C (37.53 eggs/ female) and lowest at 37ºC (13.16 eggs/ female), which was very close to that observed at 15 ºC (13.44 eggs/ female). The mean gross hatch rate of the eggs of the predator ranged from 88 % to 100 %, which was lowest at 37 °C and highest at both 25 °C and 27 °C. Our results demonstrated that the reproductive performance of *N. barkeri* decreased at the extreme temperatures examined (15 °C and 37 °C), but increased at optimum range of temperatures especially between 25 °C and 30 °C, which was the best at 27 °C. Knowledge on the effect of a wide range of temperatures on reproductive performance and efficiency of this predator helps us to use it successfully in both indoor and outdoor conditions.

Key words: Reproductive characters, *Neoseiulus barkeri*, temperatures, two-spotted spider mite.

Effect of rapid cold hardening on the cold hardiness of the two-spotted spider mite, *Tetranychus urticae*

Samira KHODAYARI[1, 2], Saeid MOHARRAMIPOUR[1] and Karim KAMALI[1]
1. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran. 2. Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Iran

The environmental predictability hypothesis proposes that rapid cold hardening (RCH) might be common in temperate species dwelling unpredictable environments incapable of surviving freezing events. A rapid cold hardening response was studied in non-diapausing females of the two-spotted spider mite, *Tetranychus urticae,* measuring their supercooling point (SCP) and survival rates after exposure to discriminating temperatures. When laboratory reared females transferred from 25 °C reared temperature to −17 °C at a rate of 1 °C/min and then maintained for 2 h., 20% were survived. However, conditioning of females for 1–4 h at temperature ranges from 0 to 10 °C prior to expose to −17 °C for 2 h., resulted in their survival rate increase to approximately 72%. A similar rapid cold hardening response was also induced through gradual cooling of the mites at a rate of approximately 0.05 °C/min. The highest survival rate was observed on the females after 5 °C for 2 h. treatment. The values of SCP of females exposed to 5 °C for 2 h decreased significantly to −22.2 °C compared to those of the control group (−19.5 °C). It can be concluded that this species possesses a hitherto unrecognized capacity to alter cold hardiness in summer in response to environmental temperature cues over a short time scale, the underlying mechanisms needs to be explored in future.

Key words: Rapid cold hardening, *Tetranychus urticae*, Supercooling point, Cold hardiness.

Phytoseius plumifer (Acari: Phytoseiidae) prey preference and functional response on *Eotetranychus hirsti* (Acari: Tetranychidae) and *Rhyncaphytoptus ficifoliae* (Acari: Diptilomiopidae)

Mojdeh Louni and Shahriar JAFARI
Department of Plant Protection, Faculty of Agriculture, Lorestan University, P.O. Box: 465, Khorramabad, Iran. E-mail: Jafari.s@lu.ac.ir

Considerable mite damage on fig trees in south and southwestern regions of Iran has led to an increasing rate of pesticide use throughout the year. *Eotetranychus hirsti* Pritchard & Baker and *Rhyncaphytoptus ficifoliae* Keifer are major mite pests of fig trees in southern and southwestern Iran. The predatory mite *Phytoseius plumifer* Canestrini & Fanzago is an indigenous predator of the two mentioned phytophagous species in these areas. Here, we have studied the prey preference behavior of two developmental stages of the predatory mite (adult and deutonymph) *P. plumifer* on immature stages (larva, protonymph and deutonymph) of *E. hirsti* and adult stages of *R. ficifoliae* under laboratory conditions (25±1°C, relative humidity 65 ±5% and 12:12 h (L:D)) photoperiod. Also the functional response of females of the phytoseiid mite to different densities of females of *R. ficifoliae* on fig leaves was determined under above-mentioned laboratory conditions. The fig leaf discs (4×4 cm) were used in all experiments. For prey preference test the equal number of both phytophagous mites (10:10) offered to same aged deutonymph and adult stages of *P. plumifer* in 10 replication during 24 hours. The results showed that the deutonymphal stages of *P. plumifer* significantly preferred the immature stages of *E. hirsti* rather than adult stages of *R. ficifoliae*. Also the female adults of *P. plumifer* significantly preferred the immature stages of *E. hirsti* rather than adult stages of *R. ficifoliae*. Type II functional response was determined by a logistic regression model for females of the phytoseiid mite.

Key words: prey preference, *Phytoseius plumifer*, *Eotetranychus hirsti*, *Rhyncaphytoptus ficifoliae*, functional response.

Functional response of *Neoseiulus barkeri* Hughes on two-spotted spider mite (Acari: Tetranychidae)

Bahador MALEKNIA and Yaghoub FATHIPOUR
Department of Entomology, Faculty of Agricultural, Tarbiat Modares University, Tehran, Iran. E-mail: B.maleknia@yahoo.com

The various species of predatory mites feed on herbivore mites and provide high level of natural control in orchard and fields. For effective employment of Phytoseiids mites as biocontrol agents, their predation activity must be better understood, functional response is one of the critical step in determining predators ability to regulate the prey. In this study, we determined the functional responses of adult female of the generalist predator *Neoseiulus barkeri* (Hughes) (Acari: Phytoseiidae) on eggs and larvae of the two-spotted spider mite (*Tetranychus urticae* Koch) in laboratory conditions at 25ºC, 65% RH and a photoperiod of 16 h light: 8 h dark. Seven densities 2, 4, 8, 16, 32, 64, 128 of eggs and larvae were used for this experiment. The functional response of the predatory mite on eggs or larvae of *T. urticae* was type II. The attack rate and handling time were recorded 0.0765 h^{-1} and 1.032 h, 0.0435 h^{-1} and 1.725 respectively on egg and larvae of *T. urticae*. The predation rate of *N. barkeri* adult female on *T. urticae* eggs was more than its larvae. The role of generalist predatory mites in integrated and biological control of greenhouse pests was discussed.

Key words: generalist predator, attack rate, handling time, biological control.

Biology and fecundity parameters of *Typhlodromus bagdasarjani* and *Phytoseiulus persimilis* (Acari: Phytoseiidae) fed on *Tetranychus urticae* (Acari: Tetranychidae) on rose

Mona MOGHADASI, Alireza SABOORI, Hossein ALLAHYARI and Azadeh ZAHEDI GOLPAYEGANI
Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mails: moghadasi@ut.ac.ir, saboori@ut.ac.ir, allahyar@ut.ac.ir, zahedig@ut.ac.ir

In this research, the biology and fecundity parameters of *Typhlodromus bagdasarjani* Wainstein&Arutunjan and *Phytoseiulus persimilis* Athias-Henriot as phytoseiid predators of the most important rose pest, *Tetranychus urticae* Koch, were studied at 25±1°C, 75±5% RH and 16L: 8D hour photoperiod. Predator eggs were put on rose leaf discs (3×3cm^2), individually. *T. urticae* eggs, as preferred prey-stage, were offered to predators. Observations were made every 12h in immature stages and every 24 h in adult stage. The raw data were recorded for both female and male. The mean developmental times of egg, larva, protonymph and deutonymph and also adult longevity were recorded as 1.0±0.0, 1.1±0.04, 1.12±0.06, 1.33±0.07 and 21.38±1.26 days for females and 1.0±0.0, 1.06±0.03, 1.1±0.04, 0.9±0.04 and 15.52±1.31 days for males of *P. persimilis*, respectively. These parameters for *T. bagdasarjani* were recorded as 2.07±0.05, 1.68±0.05, 2.32±0.08, 2.33±0.06 and 38.95±0.79 days for females and 1.91±0.05, 1.72±0.05, 1.89±0.08, 1.91±0.06 and 18.74±0.82 days for males, respectively. The mean developmental time of deutonymph and adult longevity of *P. persimilis* had significant differences between female and male. The mean developmental times of all immature stages of *T. bagdasarjani*, except larva, and adult longevity had significant differences between female and male. The mean developmental times of all female and male immature stages were differed between two predators, significantly. The mean time estimated for pre-oviposition, oviposition and post-oviposition periods were 1.45±0.04, 17.73±1.07 and 2.2±0.44 days for *P. persimilis* and 2.18±0.06, 19.6±0.50 and 17.13±0.64 days for *T. bagdasarjani*, respectively. The mean time of oviposition period between two predators had no significant difference. The total number of eggs laid was estimated as 68.03±4.75 and 25.8±0.98 eggs/female for *P. persimilis* and *T. bagdasarjani*, respectively. Comparison of two predators showed that *P. persimilis* had higher fecundity and shorter developmental time, significantly.

Key words: Life span, oviposition, predator, spider mites.

Non-lethal effects of *Typhlodromus bagdasarjani* and *Phytoseiulus persimilis* (Acari: Phytoseiidae) on *Tetranychus urticae* (Acari: Tetranychidae) on rose leaves

Mona MOGHADASI, Azadeh ZAHEDI GOLPAYEGANI, Alireza SABOORI, Hossein ALLAHYARI and Hamideh DEHGHANI TAFTI

Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: moghadasi@ut.ac.ir

In the presence of predators, prey may alter their behavior through nonlethal predator effects in order to reduce the predation risk. *Typhlodromus bagdasarjani* Wainstein&Arutunjan and *Phytoseiulus persimilis* Athias-Henriot are phytoseiid predators that feed on all stages of *Tetranychus urticae* Koch. Here, we have investigated the nonlethal effects of predators on the developmental times of *T. urticae* at 25–26°C, 75–80% RH and 16L: 8D hour photoperiod. We prepared two treatments. In both treatments *T. urticae* females were exposed directly to predators (*T. bagdasarjani*/ *P. persimilis*) for 48h. In the second treatment, the eggs were also exposed to predator cues till their adulthood. Oviposited eggs were collected during 7h and put on rose leaf discs ($3\times3cm^2$) individually. Observations were made every 12h. In the first treatment, the mean developmental times for egg, larva, protochrysalis, protonymph, deutochrysalis, deutonymph and teleiochrysalis and also pre-adult period were recorded as 4.27±0.07, 1.25±0.06, 1.15±0.05, 1.25±0.06, 1.12±0.05, 1.1±0.04, 1.07±0.04 and 11.22±0.11 days when *T. urticae* females were exposed to *P. persimilis* and 4.42±0.05, 1.25±0.06, 1.15±0.05, 1.32±0.05, 1.1±0.04, 1.07±0.04, 1.07±0.04 and 11.4±0.08 days when these females were exposed to *T. bagdasarjani*, respectively. Both egg and pre-adult periods were significantly different with control (spider mites with no predator) ($P<0.05$ for both predators). In the second treatment, we recorded the periods as 4.23±0.05, 1.3±0.04, 1.23±0.05, 1.25±0.05, 1.18±0.04, 1.15±0.04, 1.12±0.04 and 11.47±0.08 days when *T. urticae* were exposed to *P. persimilis* and 4.27±0.05, 1.27±0.05, 1.17±0.04, 1.23±0.05, 1.15±0.04, 1.12±0.04, 1.08±0.03 and 11.28±0.14 days when they were exposed to *T. bagdasarjani*, respectively. Significant differences were obvious in spider mite egg and larval period when each of the predators were present.

Key words: Direct predation, predator, predator cues, biology.

Effects of injured conspecifics on biology and oviposition rate of *Tetranychus urticae* (Acari: Tetranychidae) on rose leaves

Mona MOGHADASI, Azadeh ZAHEDI GOLPAYEGANI, Alireza SABOORI, Hossein ALLAHYARI and Hamideh DEHGHANI TAFTI

Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. E-mail: moghadasi@ut.ac.ir

Chemical cues from injured conspecifics provide important information for prey to assess predation risk. When these chemicals are present, prey might change its behavior and physiology in order to reduce the predation risk. Here, we have investigated the direct and indirect effects of injured conspecifics on the oviposition rate and developmental time of *Tetranychus urticae* Koch on rose at 25–26°C, 75–80% RH and 16L: 8D hours photoperiod. In the first treatment, *T. urticae* females were exposed for 48h directly to the conspecifics injured by means of a fine needle while the second one consisted of females receiving only cues from injured conspecific. Thereafter, *T. urticae* females were put on rose leaf discs ($3\times3cm^2$) individually and their oviposition period and the total number of eggs laid were recorded. For the developmental times, we collected eggs laid over 7h and put them on rose leaf discs, individually. Observations were made every 12h. When *T. urticae* females were exposed to the injured conspecifics directly, the mean developmental times for egg, larva, protochrysalis, protonymph, deutochrysalis, deutonymph and teleiochrysalis and pre-adult period were estimated as 4.62±0.06, 1.20±0.04, 1.05±0.03, 1.10±0.04, 1.03±0.02, 1.10±0.04, 1.03±0.02 and 11.13±0.1 days respectively, while these were estimated as 4.65±0.05, 1.17±0.04, 1.05±0.03, 1.08±0.03, 1.03±0.02, 1.06±0.03, 1.01±0.02 and 11.06±0.09 days respectively for the *T. urticae* females that received injured conspecific cues. In none of the treatments, a significant difference was observed between treatment and control. The mean time estimated for oviposition period and the total number of laid eggs were 9.8±0.24 days and 29.85±1.61 eggs/female vs. 10±0.27 and 33.55±1.63 in control in the first treatment and 9.9±0.2 days and 26.2±1.11 eggs/female vs. 10.35±0.31 and 32.7±2.43 in control in the second treatment, respectively. There was no effect of the treatment on the duration of the oviposition period. However, the total number of laid eggs was significantly affected by the treatment. Results showed that the injured conspecific cues may decrease the fecundity of *T. urticae*.

Key words: Chemical cues, predation risk, prey, predator.

Life table parameters of twospotted spider mite, *Tetranychus urticae* (Acari: Tetranychidae) on different cotton cultivars

Ameneh RABIEI[1], Ali GOLIZADEH[1], Omid SOFALIAN[2] and Hoshang RAFIEE DASJERDI[1]
1. Department of Plant Protection, College of Agricultural sciences, University of Mohaghegh Ardabili, Aradabil, Iran. E-mail: amene.rabiei@gmail.com; 2. Department of Agronomy and Plant Breeding, College of Agricultural Sciences, University of Mohaghegh Ardabili, Ardabil, Iran.

The two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is one of the most serious agricultural pests in the world. This mite is polyphagous and attacks more than 200 host plants. It is mainly damaging on vegetables, ornamentals, fruit trees, beans and cotton. The life table parameters were estimated at 25±1°C, 60±10% RH, and a photoperiod of 18:6 (L:D) h on three cotton cultivars including Avangard, Shirpan539 and Varamin×349. The Jackknife procedure was used to calculate the pseudovalues of the life table parameters of *T. urticae* regarding daily fecundity and preimaginal mortality of this pest on the tested cultivars. According to the obtained results, there was notsignificant difference among the values of themean generation time (*T*) estimated on the cotton cultivars. Significant difference was revealed in the intrinsic rate of increase (*rm*) among cultivars and the highest and lowest values of this parameter were 0.2377 and 0.0738 (day^{-1}) on Varamin×349 and Shirpan539, respectively.Moreover, the finite rate of increase (λ) had the highest and lowest values on Varamin×349 and Shirpan539 (1.26 and 1.07day^{-1}), respectively. Furthermore, the values of the net reproductive rate (R_0) were ranged from 3.66 to 74.68 (female offspring) on Shirpan 539 and Varamin×349, respectively. These findings, could be considered as basic knowledge in integrated pest management (IPM) program of *T. urticae*.

Key words: Cotton cultivars, two-spotted mite, life table parameters.

The fecundity potential of *Neoseiulus californicus* (McGregor) (Acari: Phytoseiidae) on different strawberry cultivars

Maryam REZAIE[1], Alireza SABOORI[1], Valiallhe BANIAMERI[2] and Azadeh ZAHEDI GOLPAYEGANI[1]
1. Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mail: marezaie@ut.ac.ir; 2. Entomology Research Department, Iranian Research Institute of Plant Protection, Tehran, Iran.

Neoseiulus californicus (Acari: Phytoseiidae) is an efficient biological control agent of spider mites in a wide range of climate which its effectiveness could be affected by its host plant qualifications. Here, we investigated the fecundity potential of *N. californicus* on different strawberry cultivars (Marak, Yalova, Aliso, Gaviota, Sequoia, Camarosa and Chandler). Experiments were carried out on strawberry leaf squares (2×2 cm^2) in Pteri dishes (6 cm in diameter) with 20 replicates for each cultivar under controlled conditions (27±1°C, 70±5 % RH and 16L: 8D photoperiod) for 48 hours. Thirty eggs of two- spotted spider mite were placed on each strawberry leaf as prey. Same aged female *N. californicus* (ready to oviposit) were added to the leaf squares singly. The total number of predator eggs laid and also the distances between eggs were measured in eight hours intervals. The oviposition rates of the predator on cultivars mentioned above were compared. No significant difference was observed among the treatments, however distance of egg laid on strawberry squares in second oviposition showed significant difference. Distance between second and third oviposition on Sequia and Aliso was longer than others (8.00±1.4 and 5.17±1.55 mm, respectively). Distance between oviposition on three strawberry cultivars leaves (Camarosa, Marak and Sequioa) showed significant difference, distance between first and second oviposition were longer than others (6.5±1.21, 6.97±1.52 and 4.07±0.93 mm respectively), however on other strawberry cultivars did not show any significant difference.

Key words: *Neoseiulus californicus*, strawberry, oviposition rate.

Prey preference of *Neoseiulus californicus* (McGregor) (Acari: Phytoseiidae) between *Tetranychus urticae* Koch and *Frankliniella occidentalis* (Pergande) on different strawberry cultivars

Maryam REZAIE[1], Alireza SABOORI[1], Valialhe BANIAMERI [2] and Hossein ALLAHYARI[1]
1. Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mail: marezaie@ut.ac.ir; 2. Entomology Research Department, Iranian Research Institute of Plant Protection, Tehran, Iran.

Prey preference of general predator play an important role in the suppression of various species of pests. *Neoseiulus californicus* is effective predator which feed on plant injurious mites and insects. In this research, the prey preference of *N. californicus* was determined between different developmental stage of *Tetranychus urticae* (egg or deutonymph) and first instar larvae of *Frankliniella occidentalis* on seven strawberry cultivars (Marak, Yalova, Aliso, Gaviota, Sequoia, Camarosa and Chandler) and also the influence of western flower thrips density (1:1, 1:2, 1:3, 1:4 and 1:5) on the preference between *T. urticae* and *F. occidentalis* were examined. Experiments were carried out on strawberry leaf discs in Pteri dishes (6 cm in diameter) with 10 replicates for each cultivar under controlled conditions (27±1°C, 70±5 % RH and 16L:8D photoperiod). Same aged females of *N. californicus* were added to the leaf discs singly. After 24 hours, the total number of prey consumed was counted as the preference index of each developmental stages of two-spotted spider mite and first instar larvae of thrips that was calculated by Manly's β index. The results showed that the predatory mite in the presence of equal density of the two prey species had a clear preference for spider mites (egg or deutonymph). The manly's β index for eggs and deutonymphs of *T. urticae* on different strawberry cultivars (Marak, Yalova, Aliso, Gaviota, Sequoia, Camarosa and Chandler) were 0.79, 0.85; 0.81, 0.80; 0.78, 0.82; 0.81, 0.79; 0.82, 0.86; 0.76, 0.82 and 0.79, 0.83, respectively. The preference index of *N. californicus* between mite and thrips on different strawberry cultivars did not show any significant difference. The number of thrips consumed by *N. californicus* change when the density ratio of thrips to spider mite were increased from 1:1 to 1:5.

Key words: Prey preference, *Neoseiulus californicus, Tetranychus urticae, Frankliniella occidentalis, strawberry.*

Population fluctuation of *Tetranychus urticae* Koch (Acari: Tetranychidae) on different strawberry cultivars

Maryam REZAIE[1], Alireza SABOORI[1], Valiahhe BANIAMERI[2] and Hossein ALLAHYARI[1]
1. Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran. E-mail: marezaie@ut.ac.ir; 2. Entomology Research Department, Iranian Research Institute of Plant Protection, Tehran, Iran.

The two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is one of the most important pests of strawberry. The population fluctuation of *T. urticae* on seven strawberry cultivars (Marak, Yalova, Aliso, Gaviota, Sequoia, Camarosa and Chandler) was investigated in one of greenhouses in Tehran during April to November in 2011–2012. Sample was carried out twice a week. During each sampling, the number of mites (immatures and adults) was counted on under-surface of the leaves. Mite infestion was started at the mid-June on all cultivars and gradually increasd. The peak population of *T. urticae* was recorded in the early July, after that the mite population decreased. The average number of mites on different strawberry cultivars leaves showed significant difference. Population of *T. urticae* was high on Chandler (17.60± 0.5 (mean number of immature and adult of mites per one cm^2 of leaves)) and the least mite population were on Aliso, Seqoiua and Gaviota (8.17± 0.10, 7.9± 0.48 and 7.6± 0.32 respectively). The averge number of mite on one cm^2 of Camarosa, Marak and Yalova leaves was 9.75± 0.25, 12.92± 0.40 and 9.5± 0.30 respectively. Chandler was more susceptible than others, although the least trichomes was observed on this cultivar.

Key words: *Tetranychus urticae*, strawberry, population fluctuation.

The effect of medicinal plant on life table of *Tetranychus urticae* (Acari: Tetranychidae)

Mahsa SAFFARI[1*], Ali GOLIZADEH[1], Behrooz ESMAEILPOR[2] and Seyed Ali Asghar FATHI[1]
1. Department of Plant Protection, College of Agricultural Sciences, University of Mohaghegh Ardabili, Ardabil, Iran. E-mail: saffari.mahsa@yahoo.com; 2. Department of Horticulture, College of Agricultural Sciences, University of Mohaghegh Ardabili, Ardabil, Iran.

Two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is one of the important pests on agricultural, ornamentals plants, horticultural crops and medicinal plants in the world. Its life table parameters were evaluated on five medicinal plants including mint, *Mentha spicata* L., tarragon, *Arlemisia dracunculu* L., parsley, *Petroselinum cripum* L., lettuce *Lactuca sativa* L. and coriander *Coriandrum sativum* L. under laboratory conditions (25 ±1°C, 65 ± 5 % RH and 16L:8D h) in growth chamber. The significant difference was observed in intrinsic rate of natural increase (r_m) values on five medicinal host plants. The values r_m ranged from 0.15± 0.01on tarragon to 0.25±0.01 (females/female/day) on Coriander. In addition, the analysis of the net reproductive rate (R_0) indicated significant differences among five host plants (P <0.05). The highest R_0 was recorded on mint (77.77 ± 4.28) and the lowest value was on tarragon (12.50 ± 2.1). The significant differences were observed among doubling times (*DT*) values on five medicinal host plants, the highest and lowest values were observed on tarragon (4.58 ± 0.25days) and mint (2.68 ± 0.22 days), respectively. In addition, the mean generation time (*T*) of the female two-spotted spider mite on lettuce, mint to other medicinal plants was showed significant differences. The longest mean generation times was recorded on mint (26.86 ± 0.43 days) and the lowest value was on lettuce (13.87 ± 0.22 days), respectively. Also, the finite rate of increase (λ) of mite females was significantly lowers on tarragon than on others medicinal plants. The results showed a better performance of *T.urticae* on lettuce than on the other four medicinal plants.

Key words: Two-spotted spider mite, life table, medicinal plants.

Phytoseiulus persimilis prey preference: infected or non-infected spider mites?

Marjan SEIEDY
Department of Animal Biology, School of biology, College of Science, University of Tehran, Tehran, Iran. mseyyedi@ut.ac.ir

Determination of preference and non preference behavior of predators is important in concomitant use of multiple natural enemies to control a pest. *Beauveria bassiana* (Balsamo) Vuillemin may contribute to the suppression of spider mites in combination with *Phytoseiulus persimilis* Athias-Henriot (Acari: Phytoseiidae). Here, we have studied the female predatory mite *Phytoseiulus persimilis* Athias-Henriot preference when it could make a choice between Tween 80 treated and *Beauveria bassiana* treated (after 72 hours treatment of spider mite by fungus) spider mites on leaves of cucumber plants (*Cucumeris sativus* L. variety PS). All predator females were in the early stage of adult. Eggs of prey were removed from arenas every hour for the duration of the experiment. The number of consumed *T. urticae* adults in each Petri dish was assessed after 24 h. In order to determine whether the predator preferred one of the cucumber leaf infested with *T. urticae* infected adults by *Beauveria bassiana* DEBI008 with interval; 72 hour after infection vs. cucumber leaf infested with *T. urticae* infected adults by 0.02% Tween 80 offered, Manly's preference index (β) was calculated from the number of prey consumed. The Manly's β preference index (β) for *T. urticae* infected adults by 0.02% Tween 80 and for *T. urticae* infected adults by *Beauveria bassiana* DEBI008 with interval; 72 hour after infection were 0.95±0.01 and 0.045±0.01, respectively, that these results showed that *P. persimilis* prefers *T. urticae* infected adults by 0.02% Tween 80 rather than *T. urticae* infected adults by *Beauveria bassiana* DEBI008 with interval; 72 hour after infection. We concluded that the predatory mite was capable of recognizing fungus treated prey and preferred to prey on the non- infected ones. This represents the high adaptation of the predatory mite with fungi as an advantageous agent for biological control.

Key words: *Beauveria bassiana, Tetranychus urticae,* host preference, olfactory response, *Phytoseiulus persimilis.*

Influence of five pollens and one prey diets on some biological characteristics of *Typhlodromus bagdasarjani* Arutunjan and Wainstein (Acari: Phytoseiidae)

Davood SHIRDEL[1], Elmira HAJI MOHAMADLUO[2] and Karim KAMALI[3]

1. Agricultural and Natural Resources Research Centre of East Azarbaijan, Tabriz, Iran. E-mail: dshirdel@yahoo.com; 2. Department of Entomology, Faculty of Agriculture, Islamic Azad University, Tehran, Iran; 3. Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran.

The predatory mite, *Typhlodromus bagdasarjani*, is a phytoseiid mite species found widespread in Iran. It can be an important biocontrol agent against mites injurious to plants. Influence of feeding on pollen from almond, apple, apricot, pear and walnut, and the effect of the immature stages of *Tetranychus urticae* Koch as prey on some biological characteristics of the predatory mite was studied and compared as six different diets, using a complete randomized design (CRD). Mites were kept individually on black mulberry leaf discs at 24±2 °C temperature, 60±5 % relative humidity and a photoperiod of 16:8 (L:D) hours, with a sufficient quantity of the diets. Results showed that *T. bagdasarjani* could develop and reproduce on all of the diets offered and each of the pollen species can be alternative food for the mite. The mean developmental time from egg to adult emergence varied between the treatments from 11.69 to 21.49 days for females and 11.00 to 20.07 days for males. The shortest developmental time of females and males was found on a diet including *T. urticae* as prey and walnut, almond and apple pollens. The largest developmental time was on pear pollen. The mean longevity varied between the treatments from 17.45 to 31.26 days for females and 20.07 to 34.79 day for males. Longevity was shortest for females on pear pollen and it was largest on *T. urticae* as prey and on apricot, almond, walnut, apple pollens as alternative food. The shortest longevity of males was on pear pollen, whereas the largest was on a diet of *T. urticae* as prey and walnut pollen. Also the largest total (21.09 eggs/female) and daily fecundity (1.01 eggs/female) were on a diet of *T. urticae* as prey, whereas the smallest of these parameters were on pear pollen. According to these results, *T. urticae* as prey was a more suitable diet for *T. bagdasarjani* than each of the six pollen species. The stone fruit trees (almond and apricot) and walnut pollens were of higher nutritional value for the predatory mite than the pome fruit (apple and pear) pollens. Among diets, pear pollen had least nutritional value for *T. bagdasarjani*.

Key words: Phytoseiidae, *Typhlodromus bagdasarjani*, pollen, prey, biology.

Analysis of prey preference in *Neoseiulus californicus* (Acari: Phytoseiidae) to healthy and *Beauveria bassiana*-infected adults of *Panonychus ulmi* (Acari: Tetranychidae) in an olfactometer system

Atie SHEMSHADIAN[1], Reza TALAEI-HASSANLOUI[1], Azadeh ZAHEDI-GOLPAYEGANI [1] and Marjan SEIEDY[2]

1. Department of Plant Protection, College of Agriculture and Natural Resources, University of Tehran, Karaj, 31587-77871, Iran. E-mail: ashemshadian@ut.ac.ir; 2. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

An insect or mite may gain selective advantage if it is able to detect entomopathogenic fungi from a distance and respond via behavioral avoidance or through post-contact responses such as grooming. Pathogens may contribute to the suppression of spider mites in combination with other arthropod natural enemies. Better understanding of the factors that diminish antagonistic interaction of entomopathogens and other natural enemies could improve their integrated employment against pests. In this laboratory investigation the olfactory response of *Neoseiulus californicus* McGregor (Acari: Phytoseiidae) when receiving odors from the European red mite, *Panonychus ulmi* Koch (Acari: Tetranychidae) adults treated with distilled water and *Beauveria bassiana* AIR4-infected *P. ulmi* adults was analyzed. All experiments were replicated in plant-present case and in three independent replication. About the olfactory response of predatory mite to the odors including of *P. ulmi* adults - infested apple leaf treated with distilled water in one arm and *P. ulmi* adults- nfested apple leaf infected by *B. bassiana* AIR4, predatory mite had no preference to any of these two arms ($Gp > 0.01$). In justification of this behavior we can mention to the lack of enough time to interaction between fungus and predatory mite. Further testing is required to investigate the reason of this behavior.

Key words: *Neoseiulus californicus, Panonychus ulmi, Beauveria bassiana,* olfactory response.

Prey preference of *Neoseiulus californicus* (Acari: Phytoseiidae) to healthy and *Beauveria bassiana*-infected adults of *Amphitetranychus viennensis* (Acari: Tetranychidae)

Atie SHEMSHADIAN [1], Reza TALAEI-HASSANLOUI[1], Azadeh ZAHEDI-GOLPAYEGANI [1] and Marjan SEIEDY[2]

1. Department of Plant Protection, College of Agriculture and Natural Resources, University of Tehran, Karaj, 31587-77871, Iran. E-mail: ashemshadian@ut.ac.ir; 2. Department of Animal Biology, School of Biology, College of Science, University of Tehran, Tehran, Iran.

The olfactory response of *Neoseiulus californicus* McGregor (Acari: Phytoseiidae) when receiving odors from its prey, the hawthorn spider mite *Amphitetranychus viennensis* Zacher (Acari: Tetranychidae) adults treated with distilled water and *A. viennensis* adults infected by *Beauveria bassiana* AIR4 was analyzed. The main objective of this research was to assess interactions between *N. californicus* and *B. bassiana* in the laboratory using a Y-tube olfactometer. This information will enhance our understanding of the feasibility of concomitant use of both species in hawthorn spider mite biocontrol programmes. All experiments were replicated in two plant-absent and plant-present (balck cherry) cases. In the olfactometer, predatory mites preferred odors of plants with healthy *A. viennensis* adults to those of plants with *A. viennensis* infected by *B. bassiana* AIR4. Predatory mites also preferred odors of healthy *A. viennensis* to those of *A. viennensis* infected by fungus in absence of plants. ($Gp < 0.01$ in both cases). Our laboratory results showed that simultaneous use of *B. bassiana* and *N. californicus* is possible in biological control program of *A. viennensis* because *N. californicus* will avoid being infested with *B. bassiana*. On the other hand, they will possibly avoid plants with *B. bassiana*, which will limit the efficiency of biocontrol with both species.

Key words: *Neoseiulus californicus*, *Amphitetranychus viennensis*, *Beauveria bassiana*, olfactory response.

PHYSIOLOGY & TOXICOLOGY

Repellent effect of *Prunus laurocerasus* L. (Rosaceae) aqueous extracts against *Tetranychus urticae* Koch (Prostigmata: Tetranychidae)

Rana AKYAZI[1], Mete SOYSAL[1] and Fatih UCKARDES[2]
1. Department of Plant Protection, Faculty of Agriculture, University of Ordu, 52200, Ordu, Turkey. E-mail: ranainak@ hotmail.com; 2. Department of Biometry and Genetics, Faculty of Agriculture, University of Ordu, 52200, Ordu, Turkey.

The two-spotted spider mite, *Tetranychus urticae* Koch, is one of the main pests for field and greenhouse crops, ornamentals, annual and perennial plants in Turkey. In the recent years, the use of plant extracts as an alternative pest management has become increasingly popular, owing to the undesirable side effects of extensive use of pesticides in controlling this pest. In this study, repellency of leaves, flowers and seeds extracts of *Prunus laurocerasus* L. grown around Ordu region were investigated against *T. urticae* (under laboratory conditions. Water extracts of the plant parts were used for experiments. Concentrations used in bioassays (1%, 5% and 10% (v/v)) were prepared by diluting stock solutions with distilled water. Experiments were performed using 3 cm in diameter bean leaf disks. Half of the disks were immersed for 5 s in exctracts and after drying at room temperature, the other half was immersed for 5 s in distilled water. Adult female mites were released in the center of bean leaf. The results were assayed after 2, 6, 24, 48, 72 and 96 h by counting the number of adults present of each half of the leaf disks. All tests were carried out and evaluated in the laboratory at 25.2°C ± 1.2, 65.7 ± 4.4% R.H. and a photoperiod of 16L:8D. The results showed that repellency rate for each extract was increasing with increasing concentration. Although there was no significant differences between repellent effects of all extracts at all concentrations within the first 48 h, repellency was reduced after this time. All extracts had high repellent effect at a concentration of 10%, and there was no significant differences in the repellency when submitted to the leaf in flowering stage, flower and seed extracts (77.33, 77.67 and 96.00%, respectively). At the lowest concentration (1%), all extracts had similiar repellency rate ranging between 51.67% - 68.67% and there was no significant differences among them. Seed extract was the most effective of all extracts at 5% and 10% concentrations with the values of 92.67%, 96.00%, respectively. In conclusion, the seed extracts at 5% and 10% concentrations was found to be promising for practical application.

Key words: cherry laurel, extract, *Prunus laurocerasus*, repellent, *Tetranychus urticae,* two-spotted spider mite.

Efficacy of different plant extracts against stored grain mites of *Caloglyphus pejowaliensis* (Acari: Acaridae)

Zahid MEHMOOD SARWAR, Muhammad HAMID BASHIR, Bilal SAEED KHAN and Muhammad ASIF QAYYOUM
Department of Agri. Entomology, University of Agriculture, Faisalabad, Pakistan.

Mites are the major pest of stored products; particularly wheat is greatly affected by these mites during storage. They are minute Arthropods and microscopic in size that are widely distributed throughout the world and damage almost all types of stored grains. In this research the efficiency of methanolic extracts of leaves of commonly found plants i.e Neem (Azadirachta indicaL.), Kanair (Phoenix careinsis), Amaltas (Casia fistula) and Dhatura (Datura stramonium L.) was carried out against stored grain mites of family Acaridae in laboratory. Amaltas gave 91% mortality after 28 days. Neem caused 88% mortality, Kanair 84% and Dhatura 74% mortality. The LC50 values decreased with the passage of time for all the methanolic extracts. Dhatura was least effective with 74% mortality after 28. Amaltas was found more effective for the management of these mites.

Key words: Botanicals, Mites, Wheat, Alcohol.

Documentation, economic importance of mites infesting medicinal plants in India and their management with bio-pesticides including phyto-pesticide and entomo-pathogenic fungi

Salil K. GUPTA
Medicinal Plants Research Unit, Ramakrishna Mission Ashrama Narendrapur, Kolkata-7000103, India. E-mail: salil_zsidumdum@yahoo.com

Medicinal Plants in India are being used since 5000 years under Indian System of Medicines (ISM) mostly as traditional herbal drugs and recently their uses have been diversified as phyto-pesticides, phyto-chemicals, as flavouring, colouring, dyeing agents, in preparation of nutraceuticals and food supplements especially by the poor rural mass. This varied importance has led to encourage cultivation of medicinal plants more intensively and attempts are being made to encourage their uses in day-to-day health care because of being cost effective, easily available and relatively free from side effects. However, the increase in cultivation of medicinal plants has invited pest problems including mites. Their attack especially during the summer season causes substantial economic loss that, in turn, affect the quality and quantity of medicinal plants and that ultimately affects their therapeutic values. Hence, studies were undertaken to explore and document the mites infesting medicinal plants, record observations regarding nature and extent of damage and undertake their management with phyto-pesticides and entomo-pathogenic fungi. It may be mentioned here that these do not leave behind any residues on the plants and the presence of those will be highly harmful for human beings because of their use in preparation of herbal drugs and where a use of synthetic chemical pesticides are unadvisable because of their contamination with drugs. The present communication embodies the results of these studies. The survey of the medicinal plants by the author in different parts in India and scanning the available publications, it appears that a total of 287 species of mites are so far known to occur on medicinal plants in India which include 219 species belonging to phytophagous group, 63 to predatory group and 5 to fungivorous group. Among these, 15 species (Tetranychidae-7, Tinuipalpidae-4, Tarsonemidae-1, Eriophyidae-3) are injurious pests of medicinal plants, often causing yellowing, browning, curling, defoliation, stunting of growth and sometimes death of the plants. On the contrary, among the predatory mites, 5 species all belonging to Phytoseiidae are effective and potential predators helping substantially in natural control of pests. Among the phyto-pesticides attempted to control mite pests, the leaf extracts of *Azadirachta indica, Melia azadiracht, Nerium odorum, Anona squamosa, Ocimum gratisssimum, Curcuma longa, Artemisia nilagirica, Mentha arvensis, Capsicum annum, Vitex negundo, Allium sativum etc.* were found to be very effective registering mortality to the extent of 70-90 %, 120 hours of application. Among the entomo-pathogenic fungi, *Metarhizium anisopliae, Lecanicillium lecanii, P. fumosoroseius* and *Beauveria bassiana,* which were tried, the descending order of efficacy was *L. lecani > M. anisopliae> P. fumusoroseius > B. bassiana.*

Key words: *Metarhizium anisopliae*, *Lecanicillium lecanii*, *P. fumosoroseius*, *Beauveria bassiana*.

Ovicidal, larvicidal and adulticidal effects of essential oil of *Salvia sahendica* (Lamiaceae) on *Tetranychus urticae* Koch (Acari: Tetranychidae)

Maryam KAVEH, Jahangir KHAJEALI and Nafiseh POORJAVAD
Department of Plant Protection, College of Agriculture, Isfahan University of Technology, Isfahan 8415683111, Iran. E-mail: m.kaveh@ag.iut.ac.ir

The two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is an important pest of greenhouse, vegetable and ornamental crops. The management is commonly done based on the repetitive applications of chemicals, resulting in environmental pollution and resistance in the pest population. In recent years, essential oils, plant extracts and plant secondary metabolites have received much attention as pest control agents because of their insecticidal, acaricidal, repellent and antifeedant properties. In the present study, fumigant toxicity of the essential oil from *Salvia sahendica* (Lamiaceae) was evaluated against the eggs, larvae and adults of *T. urticae*. The essential oil was extracted by water steam distillation using a Clevenger apparatus from *S. sahendica*. Bioassays were carried out using a vapour-phase mortality method in 5 concentrations (2.5, 5, 10, 20 and 25 µl/l air) for adults, 5 concentrations for larvae (1.25, 2.5, 5, 10 and 22.5 µl/l air) and 4 concentrations (5, 25, 50, 75 µl/l air) for eggs, plus the control (acetone). Four replications of each treatment were used and each replicate consisted of 20 adult females or 50-75 larvae or eggs. For each treatment one µl of the essential oil was applied on the inner surface of the Petri dishes. They were maintained at 26±2°C, 55-60% RH, and a photoperiod of 16:8 (L:D). Adults, larvae and eggs mortality were determined 1, 1 and 5 days after treatment, respectively. The LC_{50} values of fumigant toxicity of the essential oil against *T. urticae* eggs, larvae and adults were 15.2, 5.3 and 7.3 µl/l air, respectively. Essential oil from *S. sahendica* showed acaricidal activities in a dose-dependent manner and more toxic on the larval stage of *T. urticae*. The results suggest that the essential oil of *S. sahendica* has the potential to be employed in the pest management programs designed for the control of *T. urticae*.

Key words: Fumigant toxicity, Spider mite, Acaricide.

Oviposition deterrence of nanoencapsulated *of Cuminum cyminum* essential oil on citrus red mite (Acari: Tetranychidae)

Mohammad BASHIRI[1,*], Saeid MOHARRAMIPOUR[1], Maryam NEGAHBAN [1] and Shabanali MAFI PASHAKOLAEI[2]
1. Department of Entomology, Faculty of Agriculture, TarbiatModares University, Tehran, Iran. E-mail: mohammad.bashiry @gmail.com; 2. Agricultural and Natural Resources Research Center of Mazandaran, Sari, Iran

Citrus red mite, *Panonychus citri* McGregor, is one of the most serious pests of citrus orchards in the worldwide and Iran, Mazandaran. As the other spider mites this species laysa lot of eggs in their lifetime thus using acaricides with ovicidal effect is suitable forcontrol of this pest. However, some essential oils have oviposition deterrence effectsand can be a good alternative to pesticidesbut it needs an appropriate formulation. In this research, the essential oil of *Cuminum cyminum* L. was nanoencapsulated by *insitu*-polymerization of oil/water emulsion in nano scale. Then oviposition inhibitionof produced nanoencapsulated essential oil (NEO) were examined against *P. citri* and compared with a conventional acaricide (fenpayroximate). To investigate the effect of NEO on the ovipositionreduction, four concentrations (100, 300, 500 and 1000 ppm) of NEO were used. Mean number of eggs deposited post treatment by above mentionedconcentrations was 5.25, 7.75, 7.25 and 8.75, respectively that have significant difference with control (16). Butthere was not significant diference among the different concentrations of the NEO and conventional consentration of fenpayroximate (7.25). Therefore the NEO slow-release formulationis effective reduction in oviposition and deter mite oviposition andmay also represent a new categoryclass of bioacaricide whose costs ofproduction and use in the future would be favored by changing requirements forhuman/environmental safety, highly developed formulation technologies and user acceptability.

Key words: *Panonychus citri*, *Cuminum cyminum*, Nanocapsule, oviposition deterrence.

The Influence of lethal dose of some pesticide on life table parameters of the predatory mite *Neoseiulus californicus* (Acari: Phytoseiidae) fed on European red mite

Mostafa MAROUFPOOR, Youbert GHOOSTA and Ali Asghar POURMIRZA
Department of Plant Protection, Agriculture faculty, University of Urmia, Iran. E-mail: M.Maroufpoor@urmia.ac.ir; ghoosta@gmail.com; Apourmirza1@yahoo.com.

Laboratory bioassays were conducted to evaluate the effects of a series of insecticides concentrations onlife history and life-table parameters of *Neoseiulus californicus*is an important natural enemythat feeds on many spider. The European red mite, *Panonychus ulmi*, an important pest in Iran apple orchards, was used as prey. The insecticides testedcaused a significant reduction in the net fecundity/fertility throughout the trial. The results indicated that adverse effects of the insecticideson population growth of *N. californicus* were significant. The intrinsic rate of increase (r_m) the net reproduction rate (R_0) and finite rate of increase (λ) were significant reduced in treated female compared to control. It could beconcluded that lethal concentrations can significantly reduce the population growth of *N. californicus* and this should be considered in integrated pest management programs.

Key words: Demography, Fecundity, *Panonychus ulmi*, Population growth, the intrinsic rate of natural increase.

Ovicidal efficacy of *Citrus sinensis*, *Cupresus macrocarpa* and *Eucalyptus camaldulensis* essential oils against *Tetranychus urticae*

Faeze SHARIATI[1], Mahmoud MOHAMMADI SHARIF[2] and Alireza HADIZADEH[2]
1. Department of Plant Protection, Agricultural Sciences and Natural Resources University, Sari, Mazandaran, Iran. E-mails: f.shariati@ymail.com, msharif59@yahoo.com, arhadizadeh@yahoo.com

The Two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae), is one of the destructive pests of greenhouse crops. Application of plant origin compounds as appropriate alternatives for chemical acaricides. In this study, the ovicidal efficacy of orange (*Citrus sinensis*), Monterey cypress (*Cupresus macrocarpa*) and eucalyptus (*Eucalyptus camaldulensis*) essential oils were evaluated against one-day old eggs of this mite. The essential oils were prepared by Clevenger apparatus using dried leaves of cypress and eucalyptus and fruit peels of orange. 700 ml glass vials and Whatman filter paper were applied in bioassays. The leaf discs containing 20 eggs were exposed to the essential oils for 24 hour and non-hatched eggs were counted 5 days after treatments. The LC_{50} values for *E. camaldulensis*, *C. macrocarpa* and *C. sinensis* were 0.63, 1.23 and 5.95 µl/L air, respectively. Ovicidal efficacy of eucalyptus and cypress were significantly more than orange essential oil (95% confidence limit). Although eucalyptus efficacy was 1.95 times more than cypress essential oil but their efficacy was not significantly differed. The LC_{90} values of the essential oils were 1.95, 2.57 and 10.84 µl/L air respectively. The assessed plant-origin materials are appropriate alternatives for current chemical fumigants and partially other chemical control measures. Despite of lower efficacy of orange essential oil (4.8 and 9.5 times less than cypress and eucalyptus essential oils), by considering the ratio of dry weight to extracted essential oil, orange essential oil is an appropriate candidate, too.

Key words: plant essential oil, Ovicidal effect, *Tetranychus urticae*, greenhouse mite pests.

VETERINARY & MEDICAL ACAROLOGY

A survey of ticks (Acari: Ixodidae) on cattle, sheep and goats and their seasonal abundance in Erbil governorate during 2010

Khalis A. HAMAD AMEEN[1], Basima A. ABDULLAH[2] and Riyad A. ABDUL-RAZAQ[3]

1. Dept. of Plant Protection, College of Agriculture, University of Salahaddin-Erbil, Iraq. E-mail: khalisahmed2006@yahoo.com; 2. Dept. of Biology (Microbiology), College of Science, University of Mosul., Iraq. E-mail: basimaaa138@yahoo.com; 3. Dept. of Biology, College of Science, University of Mosul., Iraq. E-mail: riyadaliraqi@yahoo.com

A survey was carried out to investigate the prevalence of hard tick species (Acari: Ixodidae) on cattle, sheep and goats in Erbil governorate, Iraq. A total of (1224) ticks were collected from 33, 57 and 67 infested cattle, sheep and goats respectively during activating seasons of ticks in 2010. Eight species of ticks were identified as follows: *Rhipicephalus turanicus* (344), *R. sanguineus* (327), *Hyalomma anatolicum excavatum* (265), *H. anatolicum anatolicum* (102), *H. marginatum marginatum* (85), *Boophilus annulatus* (43), *H. turanicum* (33) and *H. detritum* (25). Results indicated that the highest number of ticks were noticed on goats (553) followed by sheep (428) while cattle carried the lowest number (243). Among 1224 collected ticks, 1175 of them were adults: (771 males and 404 females). It was found that the tick species *H. anatolicum excavatum* and *R. sanguineus* were the most frequentl ticks collected in all hosts examined at all situations at different time of a year, while *B. annulatus* showed the minimum occurrence of tick species which were collected only in June and infested only a cattle in east part of Erbil Governorate. Also, the data indicated that the more tick species influences on cattle, sheep and goats in the four locations occurred in March, April, May and June. Also, results indicated that the preferable sites for the tick attachment on the host were ear (71 cases) and udder, testes and under tail (53 cases), whereas between thighs (26 cases) and under axilla (23 cases) only.According to the general total number of the different tick species, it was found that occurrence of tick initiated in March and raised gradually to reach the peak numbers through May then the number decreased gradually through Jun, July, August and October while there were no tick collected in November and December. Identification of tick species was carried out according to the keys of Robinson (1952), Hoogstraal (1956), Hoogstraal and Kaiser (1958b), Yeoman and Waker (1967), Hoogstraal *et al*., (1981), Farid (1996), Walker *et al*., (2003), Apanaskevich and Horak (2005). To confirm the identification, the specimens were sent to the Iraqi Natural History Research Center and Museum in Baghdad according to the letter No.787 in 4-10-2011

Key words: Hard tick, Cattle, Sheep, Goats, Erbil, Iraq.

Author index

A

ABDULLAH, 65
ABDUL-RAZAQ, 65
ADELI, 2
AHADIYAT , 3, 7, 10, 11, 14
AHANGARAN, 36
AHANIAZAD, 6
AKBARI, 12, 13
AKRAMI, 3, 4, 9, 20
AKYAZI, 60
ALAMI, 24
ALIKHANI, 18
ALLAHYARI, 50, 52, 53, 55
ARDESHIR, 4, 20
ARJOMANDI, 5
ASADI, 26, 27
ASGARIEH, 47
ASIF QAYYOUM, 5, 60
AZAM, 34
BABAEIAN, 18, 19, 47
BAGHERI, 30, 42
BAGHERI, 6, 8, 24
BAHRAMIAN, 7
BANIAMERI, 54, 55
BAROOZEH, 7
BARZEGARI, 46
BASHIR, 5, 60
BASHIRI, 62
BAZRAFSHAN, 8
BERTRAND, 16
BEYZAVI, 46, 47
BOHLOOLZADEH, 47
CASTILHO, 16
CHERAGHALI ,8
DANESHMANDI, 41
DANESHNIA, 9
DARBEMAMIEH, 9
DE LILLO, 22, 23, 39
DEHGHANI TAFTI, 48, 49, 53
DOSTY, 8
ESMAEILPOR, 56
FALAHZADE, 25
FARAJI, 50
FARAZMAND, 39
FARMAHINY FARAHANI, 10
FARZAN, 26, 27
FATHI, 56
FATHIPOUR, 50
FATHIPOUR, 39, 41, 52
GHAFARIAN, 10
GHAREKHANI, 6, 24
GHAREZADEH, 49
GHAREZARE, 11
GHASEMI MOGHADAM, 12
GHEBLEALIVAND, 12
GHOOSTA, 63
GOLIZADEH, 54, 56
GUPTA, 40
GUPTA, 61
GWIAZDOWICZ, 12
HADDAD IRANI-NEJAD, 12, 13, 22, 23
HADIZADEH, 31, 63
HAGHANI, 50
HAJI MOHAMADLUO, 57
HAJIQANBAR, 7, 9, 15, 21, 25, 31, 35
HAJIZADEH, 2, 29, 33
HAKIMITABAR, 13, 21, 25, 33, 34
HAMAD AMEEN, 65
HAMIDI, 14
HASANVAND, 14
HASHEMI KHABIR, 13
HASHEMINASAB PABANDI, 33
HATAMI, 21, 43, 44
HATEFI, 20
HESAMI, 36
HEYDARI, 15
HOSSEINI, 2
HOSSEINI NAVEH, 15
IRANI-NEJAD, 23
JAFAR POUR, 43, 44
JAFARI, 14, 15, 30, 40, 42, 50, 51
JAFARLOO, 46
JALAEIAN, 10, 16, 17, 30, 41
JALALIZAND, 10, 33, 43, 44
JOHARCHI, 7, 8, 10,15, 31, 33
KAMALI, H., 11, 16, 17
KAMALI, K., 14, 25, 29, 39, 49, 51, 57
KARAMI, 47

KARMAKAR, 40
KAVEH, 62
KAZAZI, 27, 28
KAZEMI, 5, 17, 18, 32, 36, 37
KESHAVARZ JAMSHIDIAN, 19
KHADEMI, 19
KHAJEALI, 62
KHALEGHABADIAN, 20
KHANJANI, 9, 22, 23, 24, 29
KHERADMAND, 30, 31, 42
KHODAYARI, 51
KIANPOUR, 21
LIN, 8
LOGHMANI, 21
LOTFOLLAHI, 22, 23
LOUNI, 40, 51
MAFI PASHAKOLAEI, 62
MAJIDI, 3, 4
MALEKI, 6, 24
MALEKNIA, 41, 52
MAROUFPOOR, 63
MOGHADASI, 52, 53
MOGHADDAM, 21
MOHAMADI, 24, 25
MOHAMMADI, 47
MOHAMMADI SHARIF, 31, 63
MOHARRAMIPOUR, 51, 62
MORAES, 11, 16
MORAZA, 22
MORTAZAVI, 25
MOSAYEB MAHDAVI, 26, 27
NAVAEI-BONAB, 27, 28
NAZARI, 24, 29
NEGAHBAN, 62
NEMATI, 20
NOEI, 29
NOURBAKHSH, 21
OSTOVAN, 14, 36
OSTOVARI, 34
PAKTINAT SAEEJ, 6, 17, 20, 32
PARSAEYAN, 28
POORJAVAD, 62
POURMIRZA, 63
RABIEI, 54
RAFIEE DASJERDI, 54
RAHMANI, 11, 41
RAHMATI, 14, 42
RAHMATI, 30
RAHMDELI, 30
RAISSI ARDALI, 31
RAJAEI, 5, 32
RAKHSHANI, 30
RAMROODI, 33
RASTEGAR, 8
RAVAN, 30
RAZAVI SUSAN, 31
REZAIE, 54, 55
SABOORI, 13, 19, 25, 29, 31, 33, 35, 36, 48, 49, 50, 52, 53, 54, 55
SADEGHI NAMAGHI, 20
SAEED KHAN, 5, 60
SAFFARI, 65
SAKENIN-CHELAV, 8
SALAHI MOGHADDAM, 34
SAMANIPOUR, 33
SARAFRAZI, 7, 11
SARANI, 34
SARWAR, 5, 60
SEDAGHAT, 34
SEDGHI, 13
SEIEDY, 34, 42, 43, 56, 57, 58
SHAKARAMI, 15, 40
SHARIATI, 63
SHEMSHADIAN, 43, 57, 58
SHIRDEL, 11, 46, 57
SHIRINBEIK MOHAJER, 6
SHOJAEI, 10
SOFALIAN, 54
SOROURI, 43, 44
SOYSAL, 60
TALAEI-HASSANLOUI, 43, 57, 58
TALEBI, 7, 15, 21
TASHAKOR, 35
TELMADARRAIY, 34
TORABI, 49
UCKARDES, 60
UECKERMANN, 11, 27, 31
WALZER, 41
YAZDANPANAH, 18, 36,
ZACHARDA, 37
ZAHEDI GOLPAYEGANI, 43, 47, 48, 49 , 50, 52, 53, 54, 57, 58
ZIEGHAMI, 34

Jalal Afshar Zoological Museum (JAZM),

**Department of Plant Protection, Faculty of Agriculture,
University of Tehran, Karaj, Iran**