



- IN THIS ISSUE:**
- Serge Kreiter highlights three papers of the 50th volume of *Acarologia*
 - Reinhard Gerecke presents a project on K. Viets' water mite collection
 - Agustin Estrada-Peña announces a tick conference in Zaragoza

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DEAR ACAROLOGISTS

We are glad to be able to present you the 3rd issue of the EURAAC Newsletter on time. In the Spotlight section, Serge Kreiter (Montpellier, France) highlights three recent papers that appeared in the 50th anniversary volume of *Acarologia*, the oldest reviewed scientific journal dedicated to the Acari. In the Forum section, Reinhard Gerecke (Tübingen, Germany) introduces a project granted by the German Science Fund (DFG) to re-work the water mite collections of K. Viets, an eminent water mite taxonomist, by combining classical morphological and molecular tools. In the Theses section, young MSc and PhD students give an overview of the contents of their theses. In the Events section, you find the details of an upcoming conference on ticks and tick-borne pathogens, co-organized by Agustin Estrada-Peña, Zaragoza, Spain.

Thanks to all contributors for sending their news and informations on time. Special thanks to the supervisors of MSc and PhD students for sending the abstracts of recently finished theses themselves or encouraging their students to send the abstracts. Please keep on informing us, the Newsletter lives from the contributions of its readers.

Deadline for news to be included in the 4th issue (November 2010) is end of October 2010.

The Editors (euraacnews@boku.ac.at)
Peter Schausberger + Stefan Peneder

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Serge Kreiter (SUPAGRO, Montpellier, France) selected and comments three recent mite papers

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The first paper is by **H. Smit*** and **R. Gerecke**** and concerns the checklist of water mites of France. This is an impressive huge work (70 pages!!!). A review is given of all species reported from France with 420 species and seven subspecies. This is a master-article for all those studying water mites in Europe and in the world! *Acarologia* 50: 21–91 (2010)

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A CHECKLIST OF THE WATER MITES OF FRANCE (ACARI: HYDRACHNIDIA)

A review is given of all species reported from France. In total, 420 species and seven subspecies have been found in France. The following synonyms are established: *Atractides vandeli* Angelier, Decamps & Rey as a synonym of *A. phreaticus* Mota,s & Tanasachi, *Atractides fonticolus gallicus* Angelier, Decamps & Rey as a synonym of *A. spinipes* Koch and *Barbaxonella pilosa* Angelier, Decamps & Rey as a synonym of *B. angulata* (K. Viets). The following species are reported for the first time: *Atractides orghidani* Mota,s & Tanasachi, *Hydrachna goldfeldi* Thor, *Hydrodroma pilosa* Besseling, *Limnesia curvipalpis* Tuzovskij, *Limnesia undulatoides* Davids, *Piona ambigua* (Piersig), *Forelia curvipalpis* K. Viets, *Mideopsis roztozczensis* Biesiadka & Kowalik, *Arrenurus octagonus* Halbert and *Arrenurus tubulator* (Müller). Moreover, *Arrenurus affinis* Koenike is reported for the first time with certainty. For each species, all references are given which contain geographical information about

their occurrence in France. Numerous new records are given, especially of species from standing waters.

The second one is by **D.E. Walter*** and **H.C. Proctor****. The authors present a literature survey and analysis of the profile of mites (Acari, exclusive of Ixodida) in recent literature and on the World Wide Web, and compare their prominence to that of spiders (Araneae). A very important paper to raise collectively the level of Acarology in general! *Acarologia* 50: 131–141 (2010)

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MITES AS MODERN MODELS: ACAROLGY IN THE 21ST CENTURY

We present a literature survey and analysis of the profile of mites (Acari, exclusive of Ixodida) in recent literature and on the World Wide Web, and compare their prominence to that of spiders (Araneae). Despite having approximately the same number of described species, spiders outshine mites on the Web, although the study of mites (Acarology) is better represented than the study of spiders (Araneology). Broad searches of scientific literature imply that publications on mites exceed those on spiders by 2-3x; however, this dominance was reversed when a smaller number of journals with broad readerships and no taxonomic orientation (e.g., Nature, Science) were surveyed. This latter analysis revealed that the topical content of mite and spider papers in these general-science journals differs significantly. A troubling levelling-off of taxonomic publications on mites also was discovered. We conclude by suggesting some strategies that acarologists and editorial boards might

follow in order to raise mites to their proper status as exemplary models for ecological and evolutionary research.

The third one is by **A.P.G. Dowling*** and **B.M. O'Connor**** and shows what can be done today in phylogenetic investigations in Acarology with new tools. *Acarologia* 50: 113–129 (2010)

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**PHYLOGENY OF DERMANYSSOIDEA
(ACARI: PARASITIFORMES)
SUGGESTS MULTIPLE ORIGINS OF
PARASITISM**

The Dermanyssoidea is an extremely diverse lineage of mites that are found as free-living predators as well as facultative and obligate parasites of mammals, birds, lepidosaurs, and various arthropod groups. The primitive condition in the group is assumed to be that of free-living predators, and parasitism is thought to have evolved numerous times throughout Dermanyssoidea. In non-phylogenetic treatments, the subfamily Hypoaspidae (Laelapidae) has been hypothesized as the most primitive group within Dermanyssoidea, and the subfamily Laelapinae has been suggested as the source of most parasitic lineages. This study uses the 28S region (domains 1-3) of the nuclear rDNA array to address phylogenetic relationships within Dermanyssoidea and the evolution of parasitism. Results suggest parasitism of vertebrates and arthropods has evolved a minimum of eight independent times, and the majority of these events have occurred outside of the Laelapinae.

CATALOGING THE LIQUID MATERIAL OF THE WATER MITE COLLECTION VIETS – AN ENCOURAGEMENT

Reinhard Gerecke, Tübingen, April 2010
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KARL VIETS (1882-1961) was one of the eminent European water mite taxonomists in the past century. The 265 papers, book chapters and books he published in his life treat species from all continents, with descriptions of hundreds of previously unknown taxa. Highlights in his published heredity are the thorough and original treatment of the German water mite fauna (1936), as well as the astonishing complete bibliography (1955) and taxonomic world catalogue of the group (1956). Along with the updated versions published by his son KURT OTTO VIETS (1982, 1987), these books will remain the irreplaceable base for everybody dealing with this speciose group.



K. Viets (1882-1961)

Slide and liquid collections

Since decades, the slide collection VIETS is conserved and curated at the Senckenberg Museum Frankfurt. With numerous types series included of species from all over the world, it is of outstanding importance as a reference for taxonomic work. However, as often in past-century

slide-mounted collections, possibilities of re-examination are restricted due to crystalline precipitations, darkening, or layers of mounting medium being too thick for the application of higher magnification objectives.

On this background, the news that the Deutsche Forschungsgemeinschaft (DFG) accepted a proposal for cataloguing and restructuring the liquid collection VIETS (father and son) is highly welcome. In fact, this part of the collection, until now not accessible to the public and of undocumented composition, is an indispensable supplement to the slide material. In many cases, species descriptions and discussions of K. VIETS were based on large populations out of which he transferred only a few selected specimens on microscopic slides. Thus the interesting material from many continents conserved in the liquid collection includes also numerous syntypes or specimens from type localities – not rarely sites meanwhile destroyed by direct or indirect human impact.



Part of Viets' collection

Molecular studies?

The project will face also another important aspect of collection

management: As water mites are traditionally conserved in KOENIKE'S fluid, a mixture due to its contents of acidic acid and glycerol helpful for clearing and dissecting the specimens, possibilities for molecular studies with old collection material are very restricted (REY et al. 2004). In consequence, a part of the new project will be dedicated to the exploration and, where possible, re-collection of classical sampling sites in the surroundings of Bremen where VIETS, as well as his teacher F. KOENIKE (1854-1924), did intense field work about 100 years ago. The new samples will produce both material suitable for molecular studies and information on change in species composition during the past 100 years.

Resisting ignorance against historic collections

On the background of the precarious financial state of many public institutions in Europe discussions on value and significance of historical biological collections not rarely end up like absurd theatre performances (for a drastic example, see the recent debate about the zoological collections of the university of Halle - <http://www.verwaltung.uni-halle.de/DEZERN1/PRESSE/MAGAZIN/2009/MAGA-209.pdf>, pp. 12-13).

We should take the decision of the DFG, a powerful public association involved in financing all kind of future-oriented research, as an encouragement: the field must not be left to people attempting to split biological research into "modern" and "old fashioned" sectors, in general with the aim to cut the "unmodern" branches. Collections of biological material from the past are of inestimable value not only as documents of gone situations, but also for

understanding present developments and forecasting the future. Ignoring these aspects means an irreparable loss of scientific culture. The VIETS project shows that a consensus may be reached also in an environment coined by modern methodological approaches. In view of the numerous cuts and restrictions imposed to Natural History Musea, these institutions are depending on external financial sources to an increasing degree – a fact obviously overlooked by colleagues working in fields that come not in touch with questions on environmental change.

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Aly H. Rasmy, General Secretary of the Egyptian Society of Acarology, calls attention to his three recent articles on forensic acarology
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ACAROLOGY AND THE LAW: HISTORY AND AREAS FOR FUTURE RESEARCH
Acarines 3: 1-2 (2009)

MITES AND INSECTS AS INDICATORS OF PHYSICAL ABUSE
Acarines 2: 1-2 (2008)

FORENSIC ACAROLOGY – A NEW AREA FOR FORENSIC INVESTIGATION
Acarines 1: 4-5 (2007)

Rakhima D. Zhaxylykova (Astana, Kazakhstan) re-emphasizes the medical importance of house dust mites
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HOW DANGEROUS ARE HOUSE DUST MITES?

According to the reports of specialists in household and industrial conditions the acarological fauna is enriched by new kinds of mites in all countries every year. In medicine the house dust mites are considered as symbionts of the human environment. So, the *Demodex* sp are considered as symbionts of person's skin, capable to cause Discoid Lupus Erythematosus, Acne Rozacea and Demodectic Blepharoconjunctivitis in cases of decrease protective properties of an organism. The *Dermatophagoides* sp. are ranked to lodgers of bedding, only by remains of the bodies and excreta capable to provoke the development of atopic variants of respiratory allergoses of the people. About other representatives of house dust mites there are rare messages

as casual activators of Dermatitis, Gastroenterocolitis, Pulmonary Acarosis, etc. in the scientific literature. We (R.D. Zhaxylykova and V.N. Kusov) also described the cases of dermatoses, caused by *D. gallinae*, which have been found in the house dust of the treated patients. According to the scientific literature still first researchers *Demodex* sp. found out in a skin of all people (both with sick and with a healthy skin). *Dermatophagoides* sp. found out too often. Mites of both genera found out and find out in a skin of sick of Scabies.

Our acquaintance with clinic of Demodectic Acariasis began in the beginning of 1970s with supervision out of the natural infect with this infection of patients, visitors and employees of gastroenterological branch. The infection source was a patient of this branch with laboratory confirmed diagnosis. Later the clinical signs of Demodectic Acariasis were found in 98% from 2 million people whose open parts of body were examined and in 96,4% from 388780 people whose all integument were examined (the research was made in 1981-1982). The research by method of scraping of eruptions from 7817 amazed people found out the *Demodex* sp. in 99,8%, *Dermatophagoides* sp. and *Demodex* sp. in 1,6%, *Sarcoptes* sp. and *Demodex* sp. in 0,4%, the mites of all three genera in 0,4%. The research of skin in vivo (without and with provocation) from 428 amazed people in 66% was found out *Demodex* sp., in 11% - *Dermatophagoides* sp., in 23% - *Demodex* sp. and *Dermatophagoides* sp.. The clinical condition of integument of people amazed by *Demodex* sp. and *Dermatophagoides* sp. had some differences.

During 1980-1981 the density of mites in the skin of amazed people increased

every month. Since September 1981 there weren't any people with healthy skin among them. Later the number of people with an initial stage of Acariases of open parts of body began to decrease every year. Now even among the babies and children the initial stage of Acariases meets less and less (representatives of all continents were examined). Vice versa, more complicated stages of Acariases began to meet more often. It became more difficult to treat patients with Acariasis. Learning on knowledge of clinic of Acariases, we cured 8600 patients using antiparasitic treatment. Before they were unsuccessfully treated with diagnoses: Food and Medicinal Allergy, Atopic Dermatitis, Contact Dermatitis, Allergy on Decoration, Chronic Relapse Urticaria, Allergic all-the-year-round Rhinitis, Allergic Blepharconjunctivitis, Pollinoses, Asthmatic Bronchitis, Eczema, Neurodermatitis, Discoid Lupus Erythematosus, initial stage of System Lupus Erythematosus, Delirium of Parasitosis, fireplace Syndrome of Languid Skin, Psoriasis, Parapsoriasis, Rhinophyma, Rosacea, Alopecia, Keloid, Erythroderma, Demodecosis, Prurigo, Furunculosis, Photodermatosis, Acne, Vulval Leukoplakia, Vulval Kraurosis, initial stage of Vitiligo, Xanthomatosis, Precancer of Skin, Pruritus, Skin Cancer, etc. The excellent results of the spent therapy testified that their disease itself represented clinical mask of Acariases.

The sensibilization of organism of different degree of expressiveness took place in all listed cases. Therefore the positive result of treatment has been reached only by addition of anti-allergic (actually - pathogenetic) means. And, anti-allergic means were applied not only external, but also per os and (or)

parenteral. Necessity of application of such tactics of treatment was dictated by clinical picture of disease. Along with clinic, the positive result of treatment testified about defeat of mites of internal organs and fabrics of the sick person.

Components of bodies and excreta of mites are alien to human body, i.e. are allergens. It is an axiom. As all alive, mites deposit eggs, forward excretions and perish in places of dwell. The derivatives of bodies and excretions of mites are soaking up in blood of the host, although macroorganism forms protective barrier (a capsule round a colony of mites). Against of these mites allergens the macroorganism forms the antibodies, which quantity gradually increases in process of progressing of Acariasis, because the quantity of soaked up mites allergens increases. Various external (sunshine, physical influence, etc.) and internal (a foodstuff, medical products, various chemical substances, mediators of stress, toxins, etc.) factors accelerate the death of mites in places of their dwelling in macroorganism. At the same time the quantity of allergenic components of mites in blood and its neutralization by already available antibodies sharply increase. So in the macroorganism, amazed by mites, immunoallergic reaction develops with all following consequences, described by immunologists. In fact the Mite Allergy develops, which is a complication of Acariasis (at the given stage - mainly Demodecosis and Dermatophagoidosis). But the clinical medicine does not discover Mite Allergy (Acariasis) and diagnose only its consequences - the immunoallergic reactions to various provoking factors, naming them as allergens which actually are triggers.

Demodex sp. have the powerful mouth which can bite through, pierce, cut through, suck out and gnawing. Moreover they have four steams of feet. These adaptations allow them to move actually in any space and eat any food. The experts write about this. In places of the stay the mites destroy the fabrics of macroorganism. At that the leftovers of albumens, fats and other components of bodies of host qualitatively are changing. These modified components of bodies of host in process of progressing of Acariasis are soaked up in blood in escalating quantity. The modified components of own fabrics are perceived by immune system of host as alien. They are becoming autoantigens. On these components in macroorganism antibodies are produced, which are autoantibodies. Autoantibodies, incorporating with autoantigens, caused immunoallergic reaction with all consequences, described by immunologists and clinicians. So autoimmune diseases develop (diffused illnesses of a tela conjunctiva, etc.).

Diagnoses with that the patients have addressed to us and are not completely listed above, belong to allergic, dermatologic, rheumatic, oncologic, gynecologic, ophthalmologic and others, so-called non-infection diseases (NID). The NID are widespread everywhere. The house dust mites are found out everywhere. The skin of open parts of a body of people everywhere is amazed by *Demodex* sp. and *Dermatophagoides* sp.. These facts allow speaking about presence of pandemic of Mite Allergy now (actually - Demodectic and Dermatophagoidic Acariases). The reason of activation of *Demodex* sp. and *Dermatophagoides* sp. could be the liquidation of natural competitors of

biocenosis of biotope of a person (*Sarcoptes* sp., louses, etc.). Besides, excessively long symbiosis of *Demodex* sp. (since 1841) and *Dermatophagoides* sp. (since 1864) at full absence of struggle with them, at first it could provide to mites transition to ectoparasitizm and then to endoparasitizm mutual relation with a person. In the century of perfectly developed medical techniques Acarologists, able masterly find mites in any environment, and they will be easy to prove the presence of fact of ectoparasitizm and endoparasitizm by *Demodex* sp. and *Dermatophagoides* sp., despite of any adaptive transformations of appearance by these parasites. The 100% of presence of Mites Allergy are visible not only at direct survey of integument of the contemporary, but also from the screens of TVs. Please, read the articles on <http://www.medlinks.ru/article.php?sid=35694> and <http://www.allergy.kz/en/publish/detail.php?ID=68>. In future, the degree of clinical demonstrations of Mite Allergy (Acariasis) will define the laws of epidemiology, if purposeful struggle will not develop in a global scale.

Details on www.allergy.kz, English version.

COMPATIBILITY OF *PHYTOSEIULUS PERSIMILIS* (ACARI: PHYTOSEIIDAE) WITH *BEAUVERIA BASSIANA* TO CONTROL *TETRANYCHUS URTICAE* (ACARI: TETRANYCHIDAE) ON CUCUMBER PLANTS IN LABORATORY CONDITIONS

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Insecticide resistance development of the two-spotted spider mite, *Tetranychus urticae* Koch, due to the high frequency of insecticide applications led to use alternative strategies and control methods such as using biocontrol agents particularly entomopathogenic fungi. Whenever, entomopathogenic fungi are called safe that they had no or less side-effects on natural enemies and other non-target organisms. The predatory mite, *Phytoseiulus persimilis* and entomopathogenic fungus, *Beauveria bassiana* are important natural enemies of *Tetranychus urticae*. In this study, initially, the pathogenicity of four isolates, EUT105, EUT116, DEBI008 and PTTC, were studied on adult females of the two-spotted spider mite by using spray potter tower at six concentrations of isolates (10^3 - 10^8 conidia ml⁻¹). Maximum mortality percentages of adult mites were 96.87 for EUT105, 82.81 for EUT116, 74.68 for DEBI008 and 76.56 for PTTC, respectively. Causing high mortality on adult mites with the lowest LC₅₀ value (2.9×10^6 , 3.7×10^5 and 2.3×10^5 conidia ml⁻¹), isolates EUT105, EUT116 and DEBI008 were selected for the subsequent experiments.

In another experiment, the susceptibility of the predatory mite *Phytoseiulus persimilis* to *Beauveria bassiana* isolates of EUT105, EUT116 and DEBI008 was tested by using direct spray and then the isolate DEBI008, that caused more mortality on predatory mite than the other two isolates, was selected. In DEBI008, the concentration of 1×10^6 conidia ml⁻¹ that caused 50% mortality in two-spotted spider mite, was sprayed on leaf in different time intervals (0, 24, 48 and 72 hours). Afterwards, predatory mites were released on a leaf to investigate fungal effect on predatory mite survival and viability, indirectly. The results showed that spray of fungus in different time intervals do not cause significant difference in mite survival.

At the third step of this study, some behavioral parameters such as searching time (ST), feeding time (FT) and predation rate (PR) in the predatory mite, *Phytoseiulus persimilis*, were estimated when they had eaten untreated and treated adults of *Tetranychus urticae*, which had been infected with one concentration of DEBI008 (1×10^6 conidia ml⁻¹) at four time intervals (0, 24, 48, 72 hours after inoculation). Related data showed that searching time of the predator was increased in comparison to that of untreated adult mites and correspondingly, the parameters predation rate and feeding time were decreased. In reality, fungal *B. bassiana* isolate DEBI008 could affect above mentioned predator parameters. That means, *P. persimilis* responded to attendance of fungus and to the infected patches by increasing the searching time and decreasing feeding time and predation rate levels. This predator is also able to detect unhealthy patches and avoid them. In the fourth stage of this study, the type of functional response of the predatory mite *P. persimilis* was determined when it fed

on treated and untreated two-spotted spider mite adults in different time intervals (0, 24, 48 and 72 hours). According to the results, female predatory mites of *P. persimilis* showed type II functional response to fungus-treated spider mites in different time intervals and untreated spider mites. However, handling time (T_h) was different in these time intervals of infection for the predator, but searching time efficacy was stable and it had no significant difference among untreated and treated time intervals.

In the next step, host preference of the predatory mite in response to untreated adult two-spotted spider mites and treated two-spotted spider mites that had passed 12 hours of infection was investigated. It was revealed that the predatory mite prefers untreated two-spotted spider mite, significantly.

In the next step, effect of fungus-infected two-spotted spider mites on the development, oviposition and fecundity life table parameters of the predatory mite in different time intervals (0, 24, 48 and 72 hours) was investigated. The results indicated that developmental period of predatory mites fed on Tween80-treated mites (Control) and fungus-treated mites (time interval 0) was shorter than other time intervals of infection. It shows the unfavorable effect of entomopathogenic fungus with increased infection longevity. Fecundity life table parameters of predatory mite on the two-spotted spider mites treated by *B. bassiana* in different time intervals showed that parameters of generation time, doubling time, net reproductive rate, finite rate of increase and intrinsic rate of natural increase are strongly affected by fungus presence and by increasing of infection time from 0 to 72 hours in the two-spotted spider mite, these

parameters have significant differences. The lowest r_m value was observed in the time interval of 72 hours.

At the last step, the indirect odour-mediated interaction in a food chain among cucumber plant, the predatory mite *P. persimilis*, the two-spotted spider mite *T. urticae* and the entomopathogenic fungus *B. bassiana* has been studied using an olfactometer. Predator responses (avoidance or attraction) in a Y-shaped olfactometer were studied when confronted with different complexes of fungus and prey species. As a response of the predatory mite to the induced odours of a *T. urticae*-infected cucumber plant, the predator chose leaves with prey as the response of volatile production in comparison with healthy plant. About the olfactory response of predatory mite to the induced odours of *T. urticae*-infected cucumber plant treated with Tween80 in one arm and plant with fungus-treated spider mite in time intervals 0, 24, 48 and 72 hours in other arm, predator had preference to the arm containing cucumber plant with Tween80-treated spider mite. About olfactory response of predatory mite to the Tween80-treated spider mite colony and the fungus-infected spider mite in four time intervals, predator preference was to the arm containing Tween80-treated colony. Also, it was revealed that olfactory response of predatory mite to the fungus-treated spider mite colony in four time intervals in one arm and clean air (arm with no volatile), the predator was attracted to the arm with fungus-treated spider mite colony in the time intervals 0 and 24 hours. At the time intervals of 48 and 72 hours, this attraction was to the other arm. These experiments showed that predatory mites often avoid patches containing prey that pass fungal infection for a long time.

Finally, results of this research showed that DEB1008 isolate with high pathogenicity is an appropriate factor for two-spotted spider mites control. Also, the predatory mite has relative resistance against this isolate. Study on the leaf surface and in the olfactometer system revealed that predatory mites are able to detect fungus-infected prey mites and have a significant preference to the untreated mites and abstain from fungus-infected mites. So, in the presence of untreated and treated mites, predatory mites choose the healthy ones. All of these properties indicate predator compatibility with fungus for biological control of the two-spotted spider mite.

THE TRITROPHIC SYSTEM TOMATO - SPIDER MITES - *PHYTOSEIULUS LONGIPES*. STUDIES OF THE PREDATOR FEEDING BEHAVIOURS VARIABILITY AND CONSEQUENCES FOR BIOLOGICAL CONTROL

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The tomato spider mite pests *Tetranychus evansi* and *T. urticae* are difficult to control in tomato greenhouses. Their abilities to quickly develop resistances to acaricides, along with the exudation of toxic compounds from hairy solanaceous plants such as tomato and the drought occurring in tomato greenhouses, are important factors that hinder the control of tetranychids in tomato. A predaceous mite of the family Phytoseiidae, *Phytoseiulus longipes*, is a potential candidate for controlling spider mite outbreaks in these crops. Among the four known populations

of this predator, two (from Argentina and Brazil) are able to develop and reproduce well when fed on *T. evansi* on tomato, while the two others (from Chile and South Africa) cannot. After having shown that all those populations actually belong to the same species, studies about the life history and attractiveness of several of those populations depending on prey species/plant supports allowed to characterize the relationships in the tritrophic system tomato - spider mites - *P. longipes* and to confirm that there are two distinct feeding behaviours in this predatory mite species. This phenomenon is probably due to a host-plant mediated specialisation for the prey, itself coming from a co-evolution between the predator and the complex tomato - *T. urticae* and/or tomato - *T. evansi*. Study about the egg hatching response to humidity of *P. longipes* showed that this predator is among the four most drought tolerant species studied to date. Furthermore, an analysis of the indirect ecological effects of a possible introduction of *P. longipes*, along with the confirmation from semi-field trials that this predator is able to control spider mite pests in tomato greenhouses, lead to the conclusion that *P. longipes* is an excellent candidate for the biological control of *T. evansi* and *T. urticae* in tomato protected crops in Europe.

RESISTANCE OF RUBBER TREE CLONES TO THE ATTACK OF *CALACARUS HEVEAE* FERES (ACARI, ERIOPHYIDAE): BIOLOGICAL AND ECOLOGICAL ASPECTS OF MITE COMMUNITIES AND PHYSIOLOGICAL ANALYSIS OF INFESTED PLANTS

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The susceptibility of different rubber tree clones to the attack of *Calacarus heveae* Feres (Acari, Eriophyidae) was analyzed through field, laboratory and greenhouse essays. In the field essay, we studied the population dynamics of phytophagous mites and its influence on the mite community structure in six rubber trees clones, in a farm belonging to the Plantações Edouard Michelin, Itiquitira, MT. For that, 10 leaflets of 10 different plants were sampled from each of the six clonal plots, from March 2004 to March 2005. We observed in essays performed in the Laboratory of Acarology of Depto. Zoology and Botany, UNESP, São José do Rio Preto, the biological cycle, reproduction and population survivorship of 20 *C. heveae* individuals reared on detached leaflets of clones GT 1, PB 235 and RRIM 600. The essays were repeated four times, in the periods when *C. heveae* was more abundant in the field. For the greenhouse essay, performed in UNESP, São José do Rio Preto, SP, we verified the influence of *C. heveae* attack on physiological processes and on the latex yield in 9 and 11 five-months aged seedlings of the clones RRIM 600 and GT 1, respectively. The phytophagous species had different abundances on the six rubber tree clones and, consequently, influenced the occurrence and distribution of other mite species. The most susceptible clones to the attack of *C. heveae* were PB 260 and RRIM 600, while the most resistant were PB 235, PB 217 and GT 1. In the arenas made of detached leaflets, *C. heveae* had faster development, high reproductive rate and survivorship increase on PB 235 and

RRIM 600. Probably, the different ages of the plants used in field and laboratory essays influenced the conflicting results in relation to PB 235 susceptibility to *C. heveae*. The *C. heveae* attack decreased the photosynthetic rate, stomatic conductance and transpiration in the rubber tree seedlings, however, did not cause evident loss on the latex yield. Physiological alterations were less intense in RRIM 600, suggesting this clone has higher physiological tolerance to the attack of *C. heveae*.

DETERMINATION OF HARMFUL MITE SPECIES DISTRIBUTION, POPULATION DENSITY AND NATURAL ENEMIES OF THE MOST IMPORTANT SPECIES OF GREEN AREAS IN ISTANBUL

Ayşe S. Ö. Yeşilayer, PhD 2009
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This research was carried out to determine harmful mite species and their natural enemies on deciduous trees, conifer and shrubs in recreation areas of Istanbul province in 2006-2008. A total of 1200 plant samples collected from 51 plant species were infected by mites. 54 mite species belonging to 20 families were identified. 6 of these species were first records for the Turkish fauna. The species which were new records for Turkey are *Eotetranychus libocedri* McGregor (Tetranychidae), *Cheletomimus berleseii* Oudemans (Cheyletidae), *Agistemus collyerae* Gonzalez, *Mediolata chanti* Gonzalez, *Eryngiopus tauricus* Kuznetsov (Stigmaeidae), *Raphignathus gracilis* Rack

(Raphignathidae), in addition *Arctoseius* sp. (Ascidae), *Triophytydeus* sp. (Edbakerellidae), *Bakerdania* sp. (Pygmephoridae), *Pyemotes* sp. (Pyemotidae), *Eupodes* sp. (Eupodidae), *Tarsonemus* sp. (Tarsonemidae), *Platytetranychus* sp. (Tetranychidae) and *Neophyllobius* sp. (Camerobiidae) are thought new records for Turkey and mite fauna.

In the second part of the study, the population development of *Pentamerismus oregonensis* McGregor (Acari; Tenuipalpidae), which is harmful to *Cupressus arizonica* Green, was studied in 2006-2008. The population of *P. oregonensis* started to increase in April and reached the highest densities in August or October. During the studies 36 predacious mite species belonging to different families were determined.

THE RELATIONSHIP OF THE PREDATORY MITES *PHYTOSEIULUS PERSIMILIS* ATHIAS-HENRIOT AND *AMBLYSEIUS CALIFORNICUS* MCGREGOR (ACARINA: PHYTOSEIIDAE) WITH THE TWO-SPOTTED SPIDER MITE *TETRANYCHUS URTICAE* KOCH (ACARINA: TETRANYCHIDAE) AND SOME INSECTICIDES-ACARICIDES

Saied Alzoubi, PhD 2008

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Toxicities of some pesticides (hexythiazox, dimethoate and bifenthrin) against two spotted spider mite (TSSM) and predatory

mites (*P. persimilis*, *Amblyseius californicus*) were determined under laboratory and greenhouse conditions. Possibility of using the combination of biological and chemical control was investigated. In laboratory tests toxicity of pesticides against predatory mites were evaluated by the IOBC (International Organisation For Biological Control) toxicity categories. Hexythiazox was harmless-moderately harmful while dimethoate and bifenthrin moderately harmful-harmful to predatory mites.

Generally, *A. californicus* was more tolerant than *P. persimilis* to tested pesticides. In greenhouse and stable condition the selective acaricide hexythiazox, which was not toxic to predators, was compatible with predatory mites to repress the TSSM population. Therefore, the combination of hexythiazox and predatory mites can be proposed for IPM programs. Synthetic pesticide bifenthrin repressed the TSSM population well. In treatments of bifenthrin + predators (direct and residual effect), bifenthrin was effective to TSSM, in addition, harmful, moderately harmful to *P. persimilis*, *A. californicus* in sequence. For these reasons there was no support between bifenthrin and predators.

Organothiophosphate, dimethoate cannot control the TSSM well. There was compatibility between *A. californicus* and dimethoate in direct and residual effect treatments. While there was no compatibility between *P. persimilis* and dimethoate in direct effect treatment due to the negative direct effect of dimethoate on *P. persimilis* performance. Therefore, dimethoate was compatible with *A. californicus* in direct and effect case and with *P. persimilis* in residual effect case. Because of this, dimethoate can be

proposed for IPM programs. Efficacy of *P. persimilis* and *A. californicus* alone was effectual within long time than dimethoate and hexythiazox.

**EVALUATION OF THE POTENTIAL OF
NEOZYGITES FLORIDANA
(ENTOMOPHTHORALES:
NEOZYGITACEAE) FOR CLASSICAL
BIOLOGICAL CONTROL OF
TETRANYCHUS EVANSI (ACARI:
TETRANYCHIDAE) IN AFRICA**

Vitalis W. Wekesa, PhD 2008

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Supervisors: I. Delalibera Jr. and G.J. de Moraes

The tomato red spider mite, *Tetranychus evansi* Baker and Pritchard, became one of the most important pests of tomato and other solanaceous plants in Africa after its introduction in this continent. No native natural enemies are known to be associated with the pest in Africa making search for natural enemies necessary. *T. evansi* is not an important pest in South America suggesting that this mite probably originated from this region. Search for natural enemies in this region yielded several isolates of *Neozygites floridana* Weiser and Muma and one potential predatory mite for introduction in Africa. As part of the preliminary steps for introduction of this fungal pathogen in Africa, studies were conducted to determine the compatibility of *N. floridana* with the predatory mite *Phytoseiulus longipes* Evans, because the two natural

enemies are expected to complement each other. It was demonstrated that the fungus is not pathogenic to *P. longipes*. However, the presence of fungal capilliconidia on the leaf may alter the behavior of *P. longipes* by increasing grooming. Several pesticides used in tomato production were tested for their effect on *N. floridana* in order to determine their selectivity and adequacy for use in IPM programs for pest management in tomato. Two insecticides, two acaricides, and two fungicides were tested in two concentrations: the mean commercial rate (CR) and 50% of the mean commercial rate (CR/2). The fungicides captan and mancozeb affected sporulation and germination at both concentrations while propargite had no effect on sporulation but affected germination of primary conidia. Methomyl and abamectin had minimal effects on *N. floridana*. In addition, the effect of host plants of *T. evansi* on *N. floridana* was determined in relation to contamination, infection, mortality and mummification. Oviposition was used to determine host plant suitability to the mites and this was correlated to their susceptibility and subsequent mummification after infection by the fungus. Host-switching was used to determine the *in vivo* effect of accumulated allelochemicals to the fungus. There was a direct association of oviposition, plant suitability and the measured fungal parameters on all host plants with the exception of nightshade and pepper for *T. evansi* and cotton for *T. urticae*. Oviposition was also low on plants where sporulation was low suggesting that antibiosis may affect both mite reproduction and fungal activity. Mortality and mummification varied with plant species probably indicating that these processes are modulated by plant chemistry. The effects of temperature on

sporulation, infection and mummification of mites was compared among three isolates of *N. floridana*, two from Brazil (Recife and Piracicaba) and one from Argentina (Vipos-Tucumán) aiming to select potential isolates for release in different places of Africa. These parameters were measured at various constant temperature regimes from 13°C to 33°C. Six alternating temperature regimes of 17-13°C, 21-13°C, 29-13°C, 33-13°C, 33-23°C, 33-29°C at a photoperiod of 12:12h light and dark, respectively were also used to test their effect on the virulence of the three isolates against *T. evansi*. Temperature profiles in conjunction with infectivity assays can be useful in selecting appropriate isolates for a particular thermal environment.

**DIET-DEPENDENT INTRAGUILD
PREDATION BETWEEN THE
PREDATORY MITES NEOSEIULUS
CALIFORNICUS AND NEOSEIULUS
CUCUMERIS**

Dominika Mendel, MSc 2009

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Supervisor: P. Schausberger

The commonly practiced simultaneous use of generalist natural enemies in agricultural ecosystems makes studies on the occurrence of competition and intraguild predation (IGP) between biocontrol agents, and their impact on plant protection programs, increasingly important. Based on the assumption that IGP should be preferentially oriented towards competitors with greatest

resource overlap, I tested whether the generalist predatory mites *Neoseiulus californicus* and *Neoseiulus cucumeris*, which frequently engage in mutual IGP, are able to assess and respond to the risk of present and/or future food competition posed by a potential IG prey fed the same or a different diet as the IG predator. First, the predation and oviposition rates of IG predators were estimated when fed IG prey with different rearing history. Second and third, choice tests with larval and protonymphal IG prey, respectively, were conducted to assess the attack latency (aggressiveness) of IG predators and their ability to choose between IG prey presumably posing different risk of food competition.

N. cucumeris females had higher predation rates than *N. californicus*, which also resulted in slightly higher oviposition rates. Larval prey derived from pollen-fed mothers proved to be slightly more beneficial for the predators than larval prey derived from mothers fed spider mites, resulting in more eggs laid per female and day regardless of the predator species. Adult females of *N. californicus* and *N. cucumeris* differed in latency to attack prey. *N. cucumeris* was considerably faster to attack prey than was *N. californicus*. Neither generalist predator showed a preference between prey posing different risks of competition. However, there was a difference in the survival time of protonymphal prey: pollen-fed protonymphs were captured and killed significantly earlier than protonymphs previously fed spider mites. This may have led to greater profitability of pollen-fed prey than spider mite-fed prey. Further in-depth experiments are necessary to draw more firm conclusions on the influence of predator- and prey-diet on IGP between *N. cucumeris* and *N. californicus*.

BOOKS

Colloff M.J. (2009) Dust mites. CSIRO Publishing, Melbourne & Springer, Dordrecht, NL; ISBN 978-90-481-2223-3.

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- now available for open access at

http://www.nhm.ac.uk/hosted_sites/acarology/saas/e-library/pdf000300/a000203.pdf

This book is made available to the acarological community by the non-profit international society "Systematic & Applied Acarology Society (SAAS)".

JOURNALS

Acarologia

Call for papers by the Editor-in-Chief **S. Kreiter**

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As you well know, the Acari represent one of the most diverse animal groups with respect to species diversity, as well as to the variety of their life styles and ecological relationships. Thus, mites are excellent objects of investigation for all fields of evolutionary and ecological research. The fascination and scientific potential of mites can only continue to attract more and more scientists from around the world and from all scientific disciplines. The expected consequence will be an increase in knowledge and, in turn, an enhancement of excellent scientific studies requiring publication!

A few months ago, our esteemed colleague Dr Michel Bertrand announced his wish to retire and the need of a new Editorial team to ensure the future of *Acarologia*. He offered me the position of the next Editor-in-Chief of this prestigious journal, which I was proud to accept. I am also very pleased that several knowledgeable colleagues have agreed to invest their time and energy in this fascinating adventure with me, colleagues that will bring with them enthusiasm and new ideas to the editorial process!

Acarologia is fifty years-old and is therefore the oldest Scientific Journal currently publishing and devoted exclusively to the Acari. The new editorial team has been constituted under my presidency to manage this important anniversary and to take this journal into

the new decade. The managing team will be supported by a scientific editorial board composed of very eminent Acarologists from across the World. Along with changes in the editorial board, the journal will also change its format! You can find information on these changes at this new journal website built by Alain Migeon. The first big challenge of the new *Acarologia* editorial team will therefore be to publish its 50th anniversary volume in 2010 taking into account this new format.

In the name of the current managing team, I would like to thank the Acarology community for its trust, enthusiasm and support for *Acarologia* over the last 50 years. We are confident that the survival of this non-profit journal in the future will be based on both the quality of its scientific content and the diversity of authors and scientific themes that it contains. I would like also to provide our gratitude in advance to all authors who support the future of *Acarologia* by continuing to submit your scientific contributions.

Acarologia is published in one volume of 4 issues per year. Online version from 2010 is free and open-access. Print version is also available and can be obtained by subscription.

Acarologia, founded in 1959 by Marc André and François Grandjean, is the longest-publishing one among the first journals devoted to acarology.

Acarologia is a peer-reviewed journal devoted to the biology of the Acari. *Acarologia* publishes the results of original and high quality research on all aspects of acarology, including molecular biology, taxonomy, physiology, ecology, evolution, behavior, biogeography, genetics, morphology and physiology... Applied

acarology, including economic studies, plant parasites and biological control, and veterinary aspects are also accepted. All groups within the Acari are considered. The journal aims to promote and spread knowledge and research of this important group of arthropods. Four issues are published every year. *Acarologia* is indexed/abstracted in CAB Abstracts, ISI, Pascal...

Please send your papers to acarologia@supagro.inra.fr

Acarines

Call for papers by **A.H. Rasmy**, General Secretary of the Egyptian Society of Acarology
aly_rasmy@hotmail.com

The third volume of *Acarines* 2009 has been released. The 4th volume 2010 will be released after a few months. I'll appreciate receiving new papers for publication in the journal.

Systematic & Applied Acarology

Z.Q. Zhang offers a special subscription rate for EURAAC members: US\$10 online edition of volume 15 (2010).

ZhangZ@landcareresearch.co.nz

This non-profit international journal has been published in English since 1996. No 1 of 2010 includes 10 papers from authors in Australia, Argentina, Brazil, Germany, Iran, The Netherlands, New Zealand, Philippines, Russia, and USA. Vol 15 (2010) will include three issues.

http://www.nhm.ac.uk/hosted_sites/acarology/saas/saa.html

XIII INTERNATIONAL CONGRESS OF ACAROLOGY 2010

August 23 to 27, 2010
Recife, Pernambuco, Brazil

<http://www.cenargen.embrapa.br/ica13/>

3RD MEETING OF THE IOBC/WPRS WG “INTEGRATED CONTROL OF PLANT- FEEDING MITES”

September 13 to 15, 2011
Český Krumlov, Czech Republic

13TH INTERNATIONAL BEHAVIOURAL ECOLOGY CONGRESS 2010

September 26 to October 1, 2010
Perth, Western Australia

<http://isbep Perth2010.com/>

TICKS AND TICK-BORNE PATHOGENS CONFERENCE (TTP7)

August 28 to September 2, 2011
Zaragoza, Spain

<http://www.unizar.es/ttp7>

This international meeting keeps the characteristics of the previous ones, holding together in the same venue every topic related to the world on ticks and tick-borne diseases.

This time, a special meeting of the "Tick Tree of Life Group" (devoted to the phylogeny of ticks) will be also celebrated. A special session of the Society for Tropical Veterinary Medicine is also expected.

Agustin Estrada-Peña (co-organizer)
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Peter Schausberger + Stefan Peneder

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Vienna, May 2010