specific labeling of putative ryanodine receptors. Surprisingly, fluorescent-labeled ryanodine did not co-localize to either the plasma membrane associated alveolar sacs or to endoplasmic reticulum, but to mitochondria. Treatment of *Paramecium* with low (10 nM) concentrations of the oxidative phosphorylation uncoupler carbonyl cyanide phenylhydrazone (FCCP) caused depolarization-induced backward swimming behavior in high KCl concentrations comparable to dantrolene and ryanodine treatments. Cells loaded with the mitochondrial Ca^{2+} probe rhod-2 AM showed that mitochondrial Ca^{2+} levels were visibly reduced under depolarizing conditions. We have recently identified at least three different RyR sequences from the *Paramecium* genome project and have successfully amplified one from genomic DNA.

This work was supported by grant J-651 from the Jeffress Memorial Trust and a VMI Research Grant in Aid.

Czech Section—International Society of Protistologists

35th Annual Meeting
May 2–5, 2005
Nove Hrady, Czech Republic

41A

Sand fly *O*-glycoproteins play a role in attachment of *Leishmania* to the midgut wall. J. PECKOVÁ, M. SVOBODOVÁ and P. VOLF, Department of Parasitology, Charles University, Viničná 7, 12843 Prague, Czech Republic.

Attachment of *Leishmania* promastigotes to the midgut wall of their sand fly vectors is an essential part of the life cycle. It enables *Leishmania* to persist in the gut throughout sand fly defecation. *Leishmania* species differ in mechanism of the attachment. Strictly specific vector *Phlebotomus papatasi* supports development of *Leishmania major* only, and the attachment is mediated by galectin, a receptor for the abundant surface molecule, lipophosphogycan (LPG). In contrast, other sand flies (*P. halepensis*, *L. longipalpis*, *P. argentipes*) are permissive for several *Leishmania* species. We showed that LPG is not required for attachment in permissive vectors. LPG-deficient mutants of *L. major* developed well in *L. longipalpis*. We propose that *Leishmania* use another tool for interaction with the sand fly midgut cells: parasites attach to the *O*-glycosylated epitopes present on midgut microvilli. Midgut glycoproteins with the *O*-type of glycosylation were detected and characterized in *P. arabicus*, *P. halepensis*, *L. longipalpis*, *P. argentipes* and *P. perniciosus*. In contrast, *O*-glycosylation is not present in specific vectors *P. papatasi* and *P. sergenti*. We hypothesize that the *O*-glycosylated epitopes are putative ligands for the lectin-like activity present on promastigote surface. Interaction of *O*-glycoprotein(s) with *Leishmania* surface was demonstrated by incubation of *P. halepensis* midgut lysate with fixed promastigotes of *L. major*. In conclusion, the attachment mediated by *O*-glycoproteins on the sand fly midgut epithelium prevents promastigote expulsion from the gut with digested blood meal and enables successful development of the flagellate in the vector. It can also explain the differences in specificity of parasite–vector relationship between *P. papatasi*/*P. sergenti* and the permissive sand fly vectors.

42A

Histopathology of the mouse brain chronically infected with *Toxoplasma gondii*. M. PEČALKOVÁ and J. FLEGR, Department of Parasitology, Charles University, Viničná 7, Prague, Czech Republic.

Latent toxoplasmosis is an incurable parasitic disease caused by *Toxoplasma gondii* (Apicomplexa), previously considered asymptomatic. However, in the recent years it was found, that *Toxoplasma* could alter the behaviour of its animal hosts including humans. Main symptoms of the disease are the decrease of motor performance, learning capacity and memory. The physiological mechanism of these changes is unknown. Modification of the host's behaviour could be caused by a specific activity of the parasite in the neural tissue. The aim of this study was to investigate brain damages: to define the histophatological changes and to map the tissue cysts distribution in the brain of the hosts with latent toxoplasmosis. We used outbred laboratory mice of the CD1 strain (four animals). Mice were infected perorally by 10 tissue cysts of an avirulent strain of *T. gondii* (HIF) and killed 18 wk post the infection by the perfusion with Bouin's fixative. Brains were embedded in paraffin, cut at 8 μm and stained with haematoxylin & eosin. Sections were then systematically examined under a light microscope. The exact position of tissue cysts and the pathological changes in the infected tissue was noted in detail. In the brains we found massive infiltrations of inflammatory cells, mainly in the cortical regions, perivascular infiltrations and tissue vacuolisation. Occasionally, a local tissue destruction was noted. The number of cysts was 300–600; average cyst diameter was 10–100 μm. The cyst distribution was determined in relation to the dimension of brain parts, which was counted using stereotaxic mouse brain atlas. Distribution of the tissue cysts in the brain is not equal ($P < 0.001$). Cysts were found mostly in olfactory bulb, cerebral cortex, (especially in rhinal, somatosensory and motor cortex) and in the regions of dopamine pathways (substantia nigra, and ventral pallidum). Only few cysts were found in corpus callosum, tegmentum and cerebellum. *T. gondii* causes serious and persisting damageto the brain. Our results suggest that it could intervene with the motor and olfactory system, coordination and memory centres and in the major dopamine pathways of the brain, and thereby specifically modify the host's behaviour.

43A

Autotrophic picoplankton coupling with the ciliate assemblage development in a warm-monomictic, athalassohaline lake. M. MACEK*, D. PEŠTOVÁ**, G. ROSILES-GONZÁLEZ*, M. E. MARTÍNEZ-PÉREZ* and K. ŠIMEK***, *Department of Tropical Limnology, National Autonomous University of Mexico, FES Iztacala, Avenue de los Barrios 1, 54090 Tlalnepantla, Mexico, **Department of Zoology and Ecology, Masaryk University Brno, Faculty of Science, Kotlářská 2, 611 37 Brno, Czech Republic, ***Hydrobiological Institute, CAS, Na sádkách 7, 370 05 České Budějovice, Czech Republic.

Samples taken monthly for 2 yr from a high-altitude tropical lake Alchichica (Puebla, Mexico) were analysed with special interest in autotrophic picoplankton, APP–ciliates relation. Epifluorescence methods (APP autofluorescence, DAPI staining and fluorescently labelled prey [*Synechococcus* sp.], FLP-disappearance/feeding) and quantitative protargol staining of ciliates were employed. APP maxima ($< 1.3 \times 10^6$ cells/ml in the epilimnion) were observed during the onset of stratification (March/April); the ciliate assemblage was dominated with peritrichs (particularly *Rhabdostyla* sp.) on diatoms (*Cyclotella quillensis*) and also on filamentous cyanobacteria (*Nodularia* sp.) floating at the surface (maximum 56 cells/ml). The ciliates (scuticociliates and/or gymnostomatids, e.g. *Phialina* sp.) were observed concentrated either in the oxycline or above the bottom, peaking during the period of stratification (September; 30–50 cells/ml); meanwhile minimum APP (below 105 cells/ml) was observed. Throughout the season,

the most important APP-consumer ciliates were peritrichs (free swimming *Vorticella aquadulcis* complex and, less efficient, attached *Rhabdostyla* sp.) and oligotrichs (particularly *Halteria* sp.), ingesting typically 50–150 APP/cell/h. Scuticociliates (*Cyclidium glaucoma*) and mixotrophic *Euplotes* sp. were active at the oxycline, eating $\leq$50 and $\leq$150 APP/cell/h, respectively. Daily elimination calculated from ciliate-ingested FLP varied between 0.2 and 7.2%/d; maxima were found when APP already decreased. APP growth/disappearance was evaluated in 2 d in situ experiments filled either with the water filtered through 2 μm, screened through 125-μm mesh or enriched with the harvested zooplankton. APP maximum growth (0.08/d) was observed in the top 20 m layers. The highest decrease in APP was observed in the screened treatment with well-growing ciliates. On the other hand, FLP disappearance was insignificant within the method of standard deviation. The quite low growth of APP was apparently balanced with the ciliate feeding activity.

44A

Ascogregarina sp. (Apicomplexa: Eugregarinorida) from *Phlebotomus sergenti*. L. LANTOVÁ, J. VOTÝPKA, M. SVOBODOVÁ and P. VOLF, Department of Parasitology, Charles University, Viničná 7, 128 44, Prague 2, Czech Republic.

The gregarines (Apicomplexa) are parasites of invertebrates and they are thought to be highly host specific. In sand flies, few gregarine species were described, the best-known example being the eugregarine *Ascogregarina chagasi*, specific parasite of *Lutzomyia longipalpis*. In *Phlebotomus sergenti* collected in Turkey we have found a gregarine (reported below as ASP1), that differs from *A. chagasi* by several aspects. In order to compare morphology and life cycle of ASP1 with *A. chagasi* we dissected adults of *Lutzomyia longipalpis* (the Jacobina colony from Brazil) and *P. sergenti* (a colony from Turkey) of various age and physiological stage. Important differences in the life cycle and pathogenicity were found. In contrast to *A. chagasi* in *L. longipalpis*, the ASP1 causes high mortality of unfed females of *P. sergenti* under laboratory conditions. The sexual stages (syzygies, gametocysts and oocysts) of *A. chagasi* were found in males as well in unfed and blood-fed females of *L. longipalpis*. On the other hand, the gametogony of ASP1 was triggered by a blood-meal, and sexual stages were found only in the blood-fed females of *P. sergenti*. Differences were found also in morphology, with ASP1 having significantly larger gamonts and gametocysts and smaller oocysts than *A. chagasi*. Sequencing of the gene for small subunit rRNA showed that *A. chagasi* from *L. longipalpis* and the gregarine ASP1 from *P. sergenti* represent two separate species of the genus *Ascogregarina*.

45A

Effect of laser light on *Blepharisma* organisms during encystations. H. HŘÍBKOVÁ*, R. JANISCH*, J. JEŽEK** and P. ZEMÁNEK**, *Department of Biology, Faculty of Medicine, Masaryk University in Brno, Tomešova 12, 602 00, Brno, Czech Republic, **Institute of Scientific Instruments, Academy of Sciences of the Czech Republic, Královopolská 147, 61 264, Brno, Czech Republic.

The aim of this study was to gain a deeper insight into the process of encystation in the infusorian *Blepharisma undulans japonicus* and to investigate the effect of pulse laser light on selected stages of encystation. Cyst formation is a response of *Blepharisma* cells to adverse environmental conditions, such as transfer of vegetative cells from culture medium to distilled water in which cysts began to develop within 24 h. From these, 20 cysts were selected for observation of the encystation process. At each hour for 16 h and then at 20, 22, 24, 48 and 72 h, these cysts were photographed with a Camedia C-5050 Zoom (Olympus) digital camera and images were processed by M.I.S.QuickPHOTO Pro (Olympus) software to assess the size of each cyst and the thickness of its wall. For the study of laser light effects, a pulsed Nd:YAG MINILITE II laser ($\lambda = 355$ nm; pulse width, 250 and 350 μs) was used. During encystation, pear-shaped vegetative cells ($\sim$330 μm) changed into spherical cysts ($\sim$120 μm) whose walls gradually increased in thickness up to 20 μm. In the final stage, each cyst enveloped in a thick wall, had a polar protrusion with a markedly thinner wall ($\sim$5 μm). At this site and favourable environmental conditions, a vegetative cell is restored, through a process of excystation. Three selected stages of encystation were exposed to irradiation. In early-stage cysts with very thin walls (up to 2 μm) and in cysts with 8 μm walls, laser light damaged the walls at the site of irradiation (350 μs), producing perforation through which the content of the cyst leaked out. This eventually led to a complete destruction of the cyst. Final-stage cysts with thick walls ($\sim$20 μm) were resistant to damage, even after repeated exposure (250 μs). However, when the laser beam was targeted at the polar protrusion, its thin wall was destroyed and the release of cytoplasm into the medium was induced resulting in the death of the cyst.

46A

What did the RAPD analysis reveal about avian trypanosomes bionomy? L. ZÍDKOVÁ, I. ČEPIČKA & M. SVOBODOVÁ, Department of Parasitology, Charles University, Viničná 7, 128 44, Prague 2, Czech Republic.

Avian trypanosomes are heteroxenous parasites with two different hosts in their life cycle: birds and blood-sucking arthropods. Although they belong to the most widespread parasites of birds, little is known about their bionomy, probably due to their low pathogenicity. Species were described either on the concept ''one host–one trypanosome species,'' or all bird isolates were included into a single species, *Trypanosoma avium*. In our previous studies, based on the SSU rRNA phylogeny and transmission experiments, it was found that trypanosomes from raptors are transmitted by black flies and belong to the *T. avium* species complex. Another bird species, *T. corvi* from corvids, is transmitted by hippoboscid flies. In order to elucidate the diversity of bird trypanosome, we decided to aply RAPD analysis. We used trypanosomes isolated from raptors and passerines and from potential vector insects (black flies, hippoboscid flies, mosquitoes) from South Moravia, Czech Republic. We have initiated the study with 140 strains for the analysis; the number was latter reduced to 45 due to identical RAPD types of some strains. Isolates from black flies formed several clades. The first one clustered with *T. avium* (raptor clade), whereas the second one formed a sister clade, and included raptor and passerine isolates. A third ''black fly'' clade was distinct. All but one isolates obtained from hippoboscid flies were closely related to each other (the *T. corvi* clade). Most of the mosquito isolates formed a distinct clade; one clustered with a passerine isolate. Some passerine isolates were not related to any group, while some of them clustered with a raptor. The results show that both insect vectors and birds can host trypanosomes from several clades, which probably represent distinct species. Vectors of some passerine trypanosomes remain unknown.

47A

Effect of different substrates and magnesium sources on rumen ciliate population in vitro. Z. VÁRADYOVÁ, K. MIHALIKOVÁ and S. KIŠIDAYOVÁ, The Institute of Animal Physiology,

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Magnesium additives (caustic magnesite—CM and Agromag—AG) as natural products in the dose of 0.01 g were added to the fermentation bottles containing rumen inoculum from sheep and different substrates. Meadow hay (MH), wheat straw (WS), amorphous cellulose (AC) and barley grain (BG) were used as substrates and incubated with the buffered rumen fluid using an in vitro gas measuring technique. The rumen protozoa, *Entodinium* spp., Trichostomatids, large Entodiniomorphids and the total protozoan concentration were counted after 24 h of incubation. The effect of both additives on the ciliate population was not uniform and depended on the substrates used and protozoan type. Ciliate population was significantly increased in *Entodinium* spp. (AG plus BG) and *Diploplastron affinae* (CM or AG plus BG) compared to the control. Tested additives significantly decreased the population of *Entodinium* spp. (AG plus MH or AC), *Dasytricha ruminantium* (AG plus AC), *Ophryoscolex c. tricoronatus*, *Eremoplastron dilobum* and *Polyplastron multivesiculatum* (CM or AG plus BG). We conclude that both natural magnesium sources influenced protozoan population in vitro depending on the type of the substrate used.

48A

Cleaning of rumen ciliate in vitro cultures by galvanotaxis. K. MIHALIKOVÁ, Z. VÁRADYOVÁ and S. KIŠIDAYOVÁ, The Institute of Animal Physiology, Slovak Academy of Sciences, Šoltésovej 4–6, 04001 Košice, Slovak Republic.

The ability of rumen protozoa to move in an unidirectional electrical field from the anode to the cathode was tested. The aim was to concentrate the former and clean them of impurities. As an electromigration system a two-way glass stopcock with long arms was used. Migration of the ciliates (*Entodinium caudatum*, *Entodinium furca monolobum* and *Diploplastron affine*) into the cathode compartment under different electric current and time was tested. The lethal current level was 20 mA. Cell yield was 50–80% depending on ciliate species, migration time and current. Contamination of the cathode compartment by culture detritus was very low. We can conclude that cleaning of rumen ciliate in vitro cultures by galvanotaxis was very efficient in the tested device.

49A

Cryopreservation of rumen ciliate in vitro cultures—15 years of experience. S. KIŠIDAYOVÁ, Z. VÁRADYOVÁ and K. MIHALIKOVÁ, The Institute of Animal Physiology, Slovak Academy of Sciences, Šoltésovej 4–6, 04001 Košice, Slovak Republic.

Cryopreservation of rumen ciliate in vitro cultures has been performed in our laboratory for 15 yr. In total, 13 species of rumen ciliates were treated for deep-freezing in liquid nitrogen and successfully cryopreserved: *Entodinium caudatum*, *Entodinium furca monolobum*, *Entodinium simplex*, *Entodinium exiguum*, *Entodinium bursa*, *Eremoplastron bilobum*, *Epidinium ecaudatum f. caudatum*, *Eudiplodinium maggii*, *Diplodinium denticulatum*, *Diplodinium denticulatum f. anacanthum*, *Diploplastron affine*, *Ophryoscolex caudatus f. tricoronatus* and *Polyplastron multivesiculatum*. A number of parameters influenced the survival rates of the cells. Nevertheless, although optimal freezing protocols have been determined, a more generic approach has also been applied to the above-mentioned species from in vitro cultures with good results. The cryopreservation and regeneration of rumen ciliates cultivated in vitro for a prolonged period can be enhanced by long-term supplementation of cultures with osmoactive compounds and other supplements. Such an established cryobank serves as a stable source of cultures.

This project was supported by EU infrastructure Grant QLRI-CT-2000-01455.

50A

Passerine trypanosomes: morphological heterogeneity and spatial distribution of vectors. O. ČERNÝ, J. VOTÝPKA and M. SVOBODOVÁ, Department of Parasitology, Charles University, Viničná 7, 128 44, Prague 2, Czech Republic.

Trypanosomes (Kinetoplastida) belong to widely distributed parasites of bird blood, that are transmited by blood-sucking insects. However, information about their host and vector specifity, life cycles and species number is scarce. Black flies (*Eusimulium* spp.) have been confirmed as vectors of *Trypanosoma avium*, whereas *T. corvi* is probably transmitted by louse flies (*Ornithomyia* sp.). SSU rRNA sequence of trypanosome strain isolated from mosquito *Culex pipiens* revealed that it is also a bird trypanosome. In a previous study, we have found several species of birds of prey infected only with *T. avium*, while the bird host of the trypanosome isolated from *C. pipiens* was not found. 372 passerines of 23 species as candidate hosts were caught in Pálava, Southern Moravia, Czech Republic and examinated for blood parasites. Trypanosomes were found in 80 individuals, intraspecific prevalence reaching up to 56% in *Coccothraustes coccothraustes*. Two morphotypes were found which differ significantly in cell length and width, and the length of the flagellum. One form is probably *T. avium*, while the other one might be a new species. To study the infuence of vector spatial distribution, bloodsucking insects were caught simultaneously at ground level and in the canopy. Significant differences were found in insect abundances: black flies and biting midges are more common in the canopy while mosquitoes are abundant near the ground. The height of the nest may therefore influence the exposure to various *Trypanosoma*-transmitting vectors.

51A

Prevalence of cryptosporidiosis in piglets and weaning piglets. K. HAMADEJOVÁ and J. VÍTOVEC, Department of Anatomy and Physiology of Farm Animals, Faculty of Agriculture, University of South Bohemia, Studentská 13, České Budějovice 37005, Czech Republic.

In the period October 2002–December 2004, we examined 3,443 samples of faeces of piglets at the age of 2–47 d and 765 samples of faeces of weaning piglets at the age of 5–16 wk. Samples were collected as so called ''composite'' ones from the pen floor. Samplings were done in herds in the České Budějovice district. Coprological examinations were carried out within 24 h after sampling using the Sheather's sugar solution. Average prevalence of the coccidium *Cryptosporidium* sp. in piglets and weaning piglets was 5.5% and 26.1%, respectively. Cryptosporidiosis prevalence in piglets escalated from the end of the fourth week of piglet age (up to 14.3%). The highest prevalence of cryptosporidiosis in weanings was between 5 and 8 wk of age (30.0%, 30.6%, 30.7% and 25.9%). The influence of the seasonal dynamics was not apparent in our study. In infected piglets and weanings, the presence of *Cryptosporidium* species was detected most frequently in connection with formed faeces (8.0% and 28.7%) and least frequently in animals with faeces of creamy consistency (2.0% and 22.8%). From the aspect of infection intensity, most infections in piglets (88.7%) were very weak. No medium and severe cryptosporidial infections occurred in all

examined farms, although cryptosporidiosis was present in all of them.

52A

Localization of the fusion protein pyruvate:NADP+ oxidoreductase (CpPNO) in sporozoites of *Cryptosporidium parvum*. V. ČTRNÁCTÁ*, J. G. AULT**, F. STEJSKAL* and J. S. KEITHLY**, *Department of Tropical Medicine, 1st Faculty of Medicine, Charles University, Studničkova 7, 12 800, Prague, Czech Republic, **Wadsworth Center, School of Public Health, State University of New York, 120 New Scotland Avenue, Albany, NY, USA.

Anaerobic and some facultatively anaerobic protists are arteficially divided into two groups: type I protists possess enzymes for energy metabolism within the cytosol whereas type II protists compartmentalize enzymes for energy metabolism into double membrane-bounded organelles, the mitochondria. The energy metabolism of the apicomplexan *Cryptosporidium parvum* is known only partially. However, a unique fusion protein pyruvate: NADP+ oxidoreductase (CpPNO) was discovered by us in 2001. This enzyme is composed of two distinct and highly conserved domains, an N-terminal pyruvate: ferredoxin oxidoreductase (PFO) and a C-terminal NADPH-cytochrome P450 reductase (CPR). Unlike *Euglena gracilis* PNO, this protein had no N-terminal mitochondrial targeting sequence but its exact localization within *C. parvum* was unknown. Here we show both by confocal fluorescence and transmission electron microscopy the cytosolic localization of PNO within the *C. parvum* sporozoites. These data confirm that unlike iron–sulfur cluster proteins, CpPNO is not localized in the relict mitochondrion of *C. parvum*. Whether this enzyme has been secondarily transferred to the cytosol during the reductive evolution of the *C. parvum* mitochondrion, and/or whether it plays a role in the core energy metabolism of this apicomplexan, are still open questions.

53A

The effect of RNA interference down-regulation of mitochondrial RNA binding proteins (MRP) 1 and 2 on mitochondrial function and stability of respiratory complexes in *Trypanosoma brucei*. A. ZÍKOVÁ, E. HORÁKOVÁ and J. LUKEŠ, Institute of Parasitology, Czech Academy of Sciences, Branišovská 31, České Budějovice, Czech Republic.

Mitochondrial RNA binding proteins MRP1 and MRP2 occur in a heterotetrameric complex that appears to play a role in U-insertion/deletion editing in trypanosomes. Reduction in the levels of MRP 1 and/or MRP2 mRNA by RNA interference (RNAi) in procyclic *Trypanosoma brucei* resulted in reduced levels of edited cyB and RPS12 mRNAs, but little or no reduction occurred for the levels of edited cox2, cox3 and A6 mRNAs, as measured by poisoned primer extension analyses. Although editing provides translatable transcripts, inhibition of editing should affect protein synthesis and, consequently, the assembly of respiratory complexes in the kinetoplast. The steady-state level of nuclear encoded subunits of the mitochondrial respiratory complexes III and IV were significantly decreased after RNAi induction. Such induced protein degradation was selective for components of the complexes III and IV, because no effect was observed on components of the F_1F_0-ATPase complex and on several other mitochondrial proteins. The effect on an increased turnover of these imported mitochondrial proteins correlated with a decline in the levels of assembled complexes III and IV and their activities. As a consequence, the rate of oxygen consumption decreased, the decrease being selectively confined to the cyanide-sensitive respiration. Oxygen uptake by the alternative oxidase pathway was not affected.

German Section—International Society of Protistologists

24th Annual Meeting
March 2–5, 2005
Kaiserslautern, Germany

54A

Updated key to the genera of the order Oligotrichida (Ciliophora, Spirotricha). SABINE AGATHA, Fachbereich Organismische Biologie, Universität Salzburg, Hellbrunnerstrasse 34, A-5020 Salzburg, Österreich.

Oligotrichid ciliates (Ciliophora, Oligotrichida) are an important component in the marine and limnetic microzooplankton. The somatic ciliature of the oligotrichids is highly reduced, typically consisting of only two ciliary rows. Nevertheless, the diversity of patterns created by these two rows is considerable. Recently, the investigation of their evolution led to the establishment of three new families and four new genera and a revised classification. The order Oligotrichida now comprises the families Cyrtostrombidiidae Agatha, 2004; Pelagostrombidiidae Agatha, 2004; Strombidiidae Fauré-Fremiet, 1970; and Tontoniidae Agatha, 2004 with the sufficiently known genera *Cyrtostrombidium* Lynn & Gilron, 1993; *Limnostrombidium* Krainer, 1995; *Pelagostrombidium* Krainer, 1991; *Laboea* Lohmann, 1908; *Omegastrombidium* Agatha, 2004; *Strombidium* Claparède & Lachmann, 1859; *Spirostrombidium* Jankowski, 1978; *Novistrombidium* Song & Bradbury, 1998; *Parallelostrombidium* Agatha, 2004; *Tontonia* Fauré-Fremiet, 1914; *Paratontonia* Jankowski, 1978; *Pseudotontonia* Agatha, 2004; and *Spirotontonia* Agatha, 2004. These families and genera are keyed dichotomously, using simple characters usually recognizable in live and preserved specimens, such as a contractile tail, a neoformation organelle (permanent tube in which stomatogenesis takes place), and cyrtos-like pharyngeal fibres combined with the lack of ventral membranelles. The upper limit of the extrusome girdle and the distended cell surface usually indicate the position and curvature of the girdle kinety, a further important taxonomic feature. This key is designed for users not specifically trained in the identification of ciliates.

Supported by the Austrian Science Foundation (FWF; project P17752-B06).

Groupement des Protistologues de Langue Francaise (GPLF)

43rd Annual Meeting
May 15–18, 2005
Dourdan, France

55A

Molecular markers, tools for the taxonomy and phylogeny of plant and insect trypanosomes. M. DOLLET CIRAD, Campus de Baillarguet, 34398 Montpellier Cedex, France.

For convenience, the term *Phytomona* is used as the genus name for all trypanosomatids isolated from plants.This genus was created arbitrarily and was based on the host type: plant. However, they multiply in their insect vector which hosts morphologically identical trypanosomatids *Leptomonas*, *Herpetomonas*. The latter, and *Crithidia*—described as ''monoxenic trypanosomes''—also grow in fruit. Finally, they can parazite different tissues: the latex vessels (there is no obvious pathological effect); the phloem