



ABSTRACTS OF RECENT CHINESE PUBLICATIONS ON PROTOZOAN INFECTIONS<sup>1</sup> (VII)

42. Xu, X.R., Cheng, Y.Z., Lin, J.X. & Yuan, G.L. Observation on detecting intestinal protozoa by test-tube filter-paper culture. Chinese Journal of Parasitic Disease Control, 1989, 2 (1): 13-14, 55-56 (In Chinese, with English abstract)

Trophozoites of human intestinal protozoa were isolated from faeces using a modification of the test-tube filter-paper culture method for hatching nematode larvae. This method can significantly raise the rate of detection of intestinal protozoa, except for *Giardia lamblia*. Compared with the direct smear technique, the above method requires a large faecal specimen and allows the production of toxin during the incubation period, thus forcing the trophozoites to separate out from the specimen into the water. This method was used in a field survey for the examination of 2396 persons. The results are shown in the following table:

INFECTION RATES OF SEVEN INTESTINAL PROTOZOA AS DETECTED BY THE TEST-TUBE FILTER-PAPER CULTURE METHOD AND THE DIRECT SMEAR TECHNIQUE IN 2396 SPECIMENS EXAMINED

Protozoan species	Test-tube filter-paper culture method		Direct smear technique	
	Infection rate (and number infected) in 2396 specimens examined		Infection rate (and number infected) in 2396 specimens examined	
	%	(No.)	%	(No.)
<i>Entamoeba histolytica</i>	0.38	( 9)	0.04	( 1)
<i>E. coli</i>	17.95	(430)	0.04	( 1)
<i>E. hartmanni</i>	4.22	(101)	0	
<i>E. nana</i>	4.34	(104)	0	
<i>Trichomonas hominis</i>	1.75	( 42)	0.08	( 2)
<i>Balantidium coli</i>	0.08	( 2)	0	
<i>Giardia lamblia</i>	0.50*	( 12)	1.59*	(38)

\* Cyst.

<sup>1</sup> The WHO/PROTOZOA series has been chosen as a vehicle for issuing abstracts or translations in English of papers on protozoan infections (other than malaria and leishmaniasis which are dealt with separately in the WHO/MAL and WHO/LEISH document series) published in the Chinese medical and scientific press as most of this material is not readily available to interested readers outside China. The numbering of the abstracts in this document is consecutive to that of the abstracts given in the previous WHO/PROTOZOA/89.6.

This document is not issued to the general public, and all rights are reserved by the World Health Organization (WHO). The document may not be reviewed, abstracted, quoted, reproduced or translated, in part or in whole, without the prior written permission of WHO. No part of this document may be stored in a retrieval system or transmitted in any form or by any means - electronic, mechanical or other - without the prior written permission of WHO.

The views expressed in documents by named authors are solely the responsibility of those authors.

Ce document n'est pas destiné à être distribué au grand public et tous les droits y afférents sont réservés par l'Organisation mondiale de la Santé (OMS). Il ne peut être commenté, résumé, cité, reproduit ou traduit, partiellement ou en totalité, sans une autorisation préalable écrite de l'OMS. Aucune partie ne doit être chargée dans un système de recherche documentaire ou diffusée sous quelque forme ou par quelque moyen que ce soit - électronique, mécanique, ou autre - sans une autorisation préalable écrite de l'OMS.

Les opinions exprimées dans les documents par des auteurs cités nommément n'engagent que lesdits auteurs.

43. Yang, C. & Lang, S. Isolation and identification of an amoeba of the genus Naegleria. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7 (2): 97-99 (In Chinese, with English abstract)

A pathogenic free-living amoeba (strain W042302) was first isolated from the cooling water of a power plant in Shanghai in April 1986. This amoeba could result in the death of mice and was recovered from the brain tissue of the dead mice. This pathogenic free-living amoeba could be induced to grow into a trophozoite with two flagellae. Protein patterns obtained by polyacrylamide gel electrophoresis showed 12 bands stained by Coomassie brilliant blue R250. The isoenzyme patterns of both acid phosphatase and alkaline phosphatase of the amoebic extract exhibited only a single band, while lactate dehydrogenase was devoid of noticeable activity. In conclusion, it is inferred that strain W042302 may belong to Naegleria australiensis.

44. Deng, B.J. & Lian, W.N. Studies on surface electricity of Entamoeba histolytica. Chinese Journal of Parasitology and Parasitic Diseases, 1988, 6 (4): 268-271 (In Chinese, with English abstract)

Variation of surface electricity of two Entamoeba histolytica isolates (A and B) was investigated using the cell electrophoretic technique. By testing the electrophoretic condition of the amoeba in gradient pH as well as the effect of some enzymes, information was obtained concerning the physiology and pathogenicity of this parasite.

Cell electrophoresis for the isolates A and B of E. histolytica in pH 2.05-8.00 McIlvaine buffer revealed that, under the pH gradients of 3.00-8.00, electrophoretic mobility (EPM) was negative which meant that the amoeba cell surface carried a negative charge. The surface charge densities of isolates A and B were found to be (+)148.3-(-)6035.9 esu/cm<sup>2</sup> and (+)222.4-(-)6624.0 esu/cm<sup>2</sup>, respectively. In addition, except at pH 2.05, the EPMs in McIlvaine buffer were different for the two amoeba isolates to a statistically significant degree. The enzyme test showed that there was no neuraminic acid on the surface of these two amoeba isolates. The surface negative groups of amoebae were sensitive to trypsin and deoxyribonuclease I.

45. Yang, S.J., Peng, W.W., Yao, J.L. & Chen, X.J. Immunodiagnostic investigation of amoebic liver abscess. New Chinese Medicine, 1989, 20 (8): 398-399 (In Chinese)

In this study immunodiagnostic methods were used to examine 22 patients with clinical manifestations of amoebic liver abscess. The positive rate of serum IgG antibody to Entamoeba histolytica trophozoites was 100% (22/22) by both the indirect fluorescent antibody test (IFAT) and the enzyme-linked immunosorbent assay (ELISA). Intact E. histolytica trophozoites aspirated from the liver abscess were identified in 21 of the 22 patients (95.5%) by IPAT. Soluble antigen of E. histolytica trophozoites in liver pus was detectable in all cases (100%) by ELISA. Nine patients with other diseases were all negative in these immunological tests. Soluble antigen prepared from axenic culture of E. histolytica trophozoites could be detected at the concentration of 5 ng/ml of protein by ELISA. All the patients were cured with metronidazole. These immunodiagnostic methods are specific, sensitive and simple, and take only 1.5 to 2 hours to perform. They are quite useful and feasible in clinical diagnosis of amoebic liver abscess.

46. Huang, Z.D., Feng, F.C., Pan, L.J., Wu, G.D., Yang, X.S. & Zhou, D.Y. A report of 11 cases of chronic amoebic colitis diagnosed by colonoscopic biopsy and brushing. Journal of Practical Internal Medicine, 1989, 9 (3): 143 (In Chinese)

A total of 8032 cases were examined during 1974-1987 and 11 cases (0.14%) of chronic amoebic colitis were detected by colonoscopic biopsy and brushing. Of these 11 patients, 10 were males and one female. They ranged in age from 23 to 63 years. Their main complaints were abdominal pain (8 patients), bloody diarrhoea (10) and mucous diarrhoea (1). The course of their illness varied between 3 months and 10 years.

Colonic ulcers, that involved the rectum, caecum, sigmoid, left colon, ascending colon, or even the whole colonic area, were found in all of the 11 patients. Amoebic trophozoites were detected through biopsy or brushing in all 11 patients. All these patients were cured after treatment with metronidazole.

In conclusion, it was considered that pancolonoscopy with biopsy and brushing is a valuable tool in the diagnosis of chronic amoebic colitis, given the atypical nature of the disease which shows only a low positive rate for trophozoites in stool examination.

47. Cao, C.Q. & Feng, Y.S. Report on a fungus parasitizing Entamoeba histolytica. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7 (1): 12-14 (In Chinese, with English abstract)

Infection of Entamoeba histolytica with the chytridiaceous fungus Sphaeria was observed in some of the specimens obtained from a farmer and stained with iron-haematoxylin. The fungi were found in 78% of the cysts, mostly the immature ones. Within the amoeba, this parasite occurred singly, in groups, or in the form of a sporangium. It was located in the cytoplasm, the glycogen mass or the chromatoidal bars.

In the same specimen, the parasitic fungus was also found in 18% of E. coli cysts and in 11% of E. nana cysts, but only in one of the 16 E. hartmanni cysts.

This case of superimposed parasitism, the most interesting one reported so far in China, is also a rare case of several species of amoebae being heavily involved at the same time.

48. Xu, L.H., Wang, Y.F., Chen, J.L., Xu, Z.X., Yu, Y.F. & Tao, X.M. Studies on the fine structure of Toxoplasma gondii tachyzoite. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7 (2): 105-107 (In Chinese, with English abstract)

The Toxoplasma gondii tachyzoite is crescent-shaped. The pellicle of the parasite consisted of two membranes. The anterior end contains the polar ring and conoid; the former is the thickened inner membrane and the latter a cylindrical organelle made up of about 10 filaments arranged in an oblique row. The subpellicular microtubules numbering 22 originate at the polar ring and extend to the posterior end. The rhoptries extend from the conoid and terminate anterior to the nucleus with a narrow dense neck and an enlarged posterior portion with a glandular structure. The rhoptries may have a secretory function and the conoid may be related to invasion by the tachyzoite into the host cell.

49. Yang, X.Z., Yang, S.S. & Wu, Z.Q. Observations on the growth dynamics of four strains of Toxoplasma gondii in HeLa cells. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7 (1): 8-11 (In Chinese, with English abstract)

The growth dynamics of PP, CN and ZS2 strains of Toxoplasma gondii isolated in China was studied and compared with that of the RH strain. HeLa cells were used in this study. It took only 2 minutes for the organisms of the RH strain to infect the HeLa cells upon contact with the cells. By contrast, the CN strain required 5 minutes, the ZS2 and PP strains, 10 minutes.

Toxoplasma started multiplying after a lag time of about 6 h in the HeLa cells. The mean generation time of the four strains was assessed by calculating the number of parasites in the parasitophorous vacuoles at different incubation times and by the linear regression equation. The results showed that the mean generation time was 5.2 h for the RH strain, 5.98 h for the CN strain, 6.78 h for the ZS2 strain and 7.69 h for the PP strain.

Among the three strains of Toxoplasma gondii isolated in China, the CN strain was similar to the RH strain with respect to infectivity and proliferation.

50. Zong, D.G., Jiang, Y.X., Gong, J.J., Jin, H., Paierhati & Su, C. The epidemiological characteristics of toxoplasmosis in Bertala District, Xinjiang. Endemic Diseases Bulletin, 1989, 4 (1): 88-89, 98 (In Chinese)

A sero-epidemiological study was carried out in Bole City, in Jinghe County and in Wequan County among healthy local inhabitants, as well as among domestic and wild animals, in order to determine the presence of toxoplasmosis in the Bertala area. Of the 528 serum samples collected, 63 were found to be positive with an average overall infection rate of 11.9%, the average infection rate for the different localities being: 18.3% (31/169) for Wenquan County, 7% (8/114) for Jinghe County and 9.8% (24/245) for Bole City. Of the 63 seropositive cases, 15 had a very high antibody titre (1:4096), indicating the presence of active infection.

Several nationalities are present in the Bertala area and their toxoplasmosis infection rates vary in accordance with their different customs and geographical environment. The Hui and Hazahk peoples have the highest infection rates of 35.3% (6/17) and 30.8% (4/13), respectively; the Uygurs and Mongols have the second highest rates of 24.4% (21/86) and 20.0% (5/25), respectively, while the Han people have the lowest rate of 7% (27/387). On the whole, the infection rate increases with age.

Animals are an important source of infection because of their close contact with the human population. A sero-epidemiological survey of six kinds of animals revealed that cattle were widely infected and deserved close attention as they probably constituted the major source of infection, but the role of cats and dogs was not to be neglected. Another possible route of infection may be the custom, favoured by the local national minorities, of eating undercooked beef and mutton. If the cattle or sheep that provide the meat are infected, toxoplasmosis will be transmitted to man.

51. Wang, L X., Zhao, Q.L. & Yang, J.Q. Serological test for toxoplasmosis on patients from three hospitals in Shihezi. Journal of Shihezi Medical College, 1989, (1): 17-19 (In Chinese)

The indirect haemagglutination (IHA) test for toxoplasmosis was carried out in 1988 on 505 serum samples taken from patients with mental disorders or other diseases and from blood donors. Patients with mental disorders were found to have a higher rate of infection with Toxoplasma (i.e. 11.5% or 23/200) than patients with other diseases (i.e. 7.5% or 14/214). The infection rate of 9.0% (42/466) for the Han people was much lower than that of 41.0% (16/19) for the national minorities ( $P < 0.005$ ). No significant difference was observed between the infection rates of males and females. With regard to age, the 30-39 year old patients had the highest infection rate (20.5%) and the 1-9 year old patients the lowest (5.7%). The blood donors showed a positive rate of 20.9% (19/91), the positive rate for the Hans being 13.7% (10/73), while that for the national minorities was 50% (9/18). Analysis also revealed that the positive rate among the local blood donors was markedly higher than among blood donors from other areas.

52. Zou, L., Hu, X.Y., Xu, Z.G., Gu, Q.M. & Li, Y. The effect of Toxoplasma infection on pregnancy. Chinese Journal of Parasitic Disease Control, 1988, 1 (1): 45-47 (In Chinese, with English abstract)

To gain a better understanding of the effect of Toxoplasma infection on pregnancy, an analysis was made of 313 cases. The enzyme-linked immunosorbent assay (ELISA) using staphylococcal protein A was applied in the examination of these cases revealing an infection rate in pregnant women of 32.9% (103/313). The infection rates of the urban and suburban populations were 30.1% and 62.7%, respectively. The incidence of abnormal labour was 6.8% in the positive group and 0.5% in the negative group, the former being significantly higher than the latter ( $P < 0.01$ ). It is generally held that Toxoplasma infection can be transmitted to the fetus and lead to acute primary infection. Care should be taken to protect pregnant women from Toxoplasma infection.

53. Han, F. & Xu, S. Etiological diagnosis of cryptosporidiosis. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7 (1): 1-3 (In Chinese, with English abstract)

An investigation of infection with Cryptosporidium was carried out on 1014 faecal specimens collected from four hospitals in Nanjing. A smear was made of each specimen which was then screened for oocysts using the auraminephenol staining method, and the positive or suspected specimens were then identified by the modified acid-fast staining method and the safranin-methylene blue staining method. Thirteen specimens were found to be positive by the auraminephenol staining method and this was confirmed by the modified acid-fast staining method. The five suspected specimens were found to be negative by both the modified acid-fast and the safranin-methylene blue staining methods. The best result was achieved when the auraminephenol staining method was used first, followed by the modified acid-fast staining method. This procedure is simple, sensitive and reliable. When only few oocysts are present, they are difficult to detect by the safranin-methylene blue staining method.

54. Han, F. Cryptosporidiosis found in Chinese children. Chinese Journal of Pediatrics, 1989, 27 (2): 75-76, 125 (In Chinese, with English abstract)

From December 1986 to November 1987, 924 stool specimens were collected from patients suffering from diarrhoea in three hospitals in Nanjing. The auraminephenol staining method was used to screen the specimens for Cryptosporidium oocysts. For a positive or suspected specimen, diagnosis was confirmed by re-examination using the modified acid-fast and the safranin-methylene blue staining methods. This study indicated that a combination of the auraminephenol stain with the modified acid-fast stain was an effective method for diagnosis. Cryptosporidium oocysts were detected in the stools of 9 patients who were examined between August and November 1987, representing a positive rate of 1.0%. Diarrhoea was their main symptom, with 7 patients suffering from acute diarrhoea and 2 from chronic diarrhoea. All 9 patients were cured with allicin. These patients all came from rural areas in Jiangsu and Anhui Provinces and they ranged in age from 4.5 months to 8 years, with 7 of the patients being under the age of one year.

55. Zhu, G.C. & Xu, K.J. Electron microscopic observation of Pneumocystis carinii. Chinese Journal of Parasitic Disease Control, 1988, 1 (1): 32-34 (In Chinese, with English abstract)

A study was made of Pneumocystis carinii infection occurring in cortisone-treated Wistar rats. The life cycle of P. carinii comprises three main stages: the trophozoite stage, the precyst stage and the cyst stage, which all develop in the alveolar lumen. Quantitatively, the trophozoites occur in much larger numbers than do the precysts and cysts taken together. It was therefore considered that trophozoites would, in part, develop into cysts and that multiplication took place during both the cyst and the trophozoite stages. Occasionally, a few trophozoites could be seen in interstitial space, the capillary lumen and the cytoplasm of alveolar epithelial cells. A bundle of microfilament-like structures was found in the trophozoite nucleus, the function of which is unknown. Cysts were either round (oval) or banana shaped. The precyst stage was characterized by a dense clump of aggregated mitochondria.

This study suggested that the trophozoite stage was the most pathogenic stage of the whole life cycle since trophozoites might invade and damage the host cells, and the phagocytosis of the protozoa by phagocytes was the result of cellular immunity of the host.