

قسم : الباثولوجيا - كلية الطب البيطرى - جامعة أسيوط

رئيس القسم : أ.د / محمد ابراهيم الشرى

التهاب الرئة والمخ الفطرى التجريبي فى الدجاج الرومى

عبد اللطيف بيومى ، عبد الفتاح البدرى*، محمد رفاعى*، ابراهيم سكر***

تم عزل عشرة أنواع من الفطريات من عينات مأخوذة من ١٦ كتكوت رومى حديث الوفاة وكذا خمسون عينة من دجاج رومى حى والصينات قد أحضرت من محافظة الوادى الجديد وقناة بصعيد مصر .

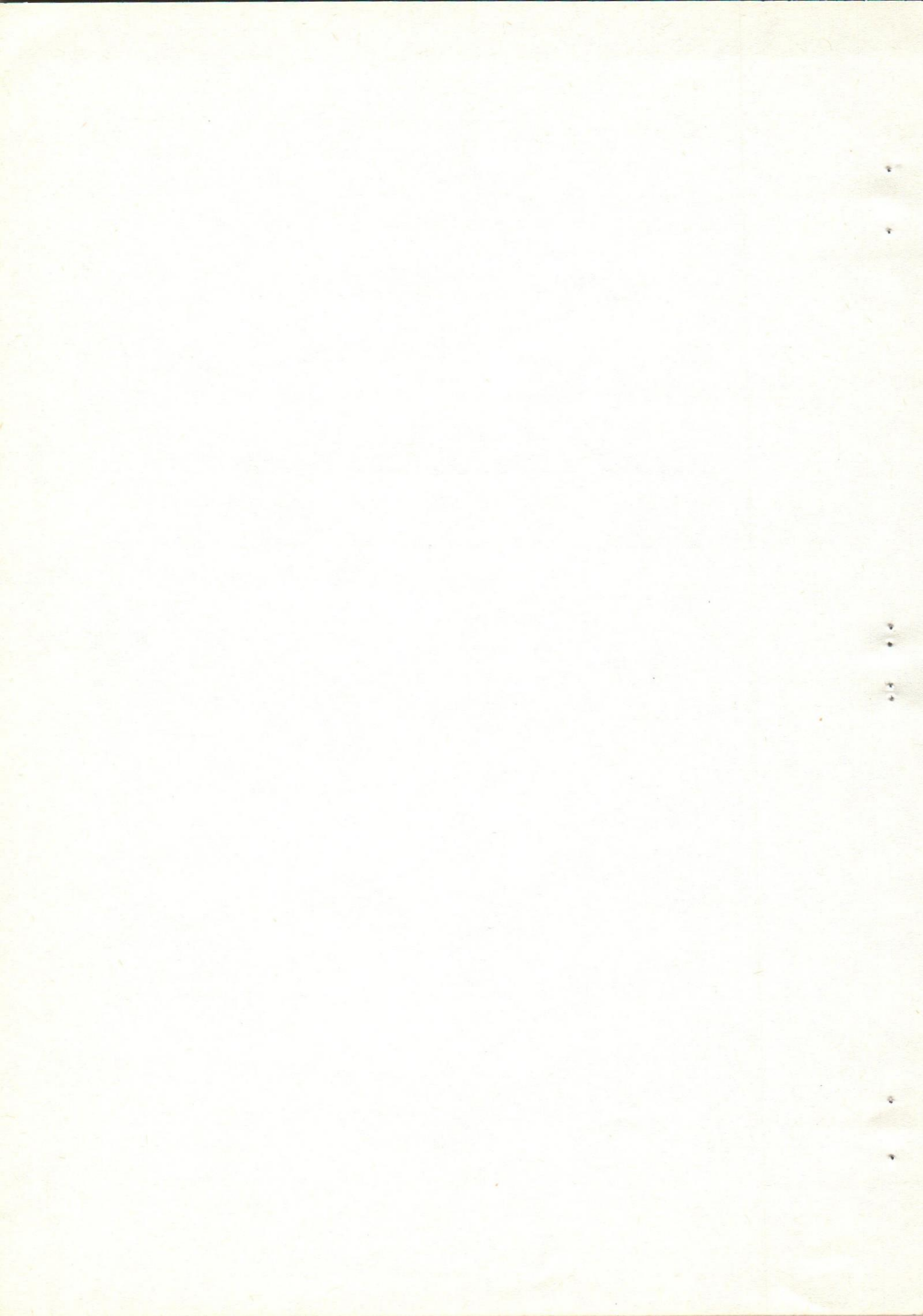
اختير أحد هذه الأنواع وهو اسبيروجيلس فليفس وأعدت به كتاكيت رومى سليمة أحضرت من محافظة بنى سويف .

ووضعت النتائج المجهريية الميكروسكوبية ونوقشت النتائج . كذلك تم اختبار حساسية هذا الفطر لعدد تسعة من الأدوية والكيمائيات المختلفة ووضعت النتائج ونوقشت .

* معمل بحوث صحة الحيوان - محافظة قنا

** قسم الميكروبيولوجيا - كلية الطب البيطرى - الجيزة

*** قسم طب الحيوان وأمراض الدواجن - كلية الطب البيطرى - أسيوط



Dept. of Pathology, Animal Med. and Poultry Dis.,
Faculty of Vet. Med., Assiut University,
Head of Dept. Prof. Dr. I.M.H. Sokkar.

EXPERIMENTAL MYCOTIC PNEUMONIA AND ENCKERHALOMALACIA IN TURKEY POULTS (With 8 Figures & 3 Tables)

By
A.H. BAYOUMI, A.A. EL-BADRY, I.M.H. SOKKAR and M.K. REFAI
(Received at 13/12/1981)

SUMMARY

Ten fungal species could be isolated and identified from freshly dead and apparently healthy turkeys in upper Egypt. Three weeks old native breed trudey poults were inoculated into the left abdominal air sac, each with 0.5 ml. of *A. flavus* suspension.

The symptoms as well as the macroscopic and microscopic appearance of the lesions suggest a pneumo-encephalo-malitic disease.

Reisolation of the inoculated fungus and its sensitivity to nine drugs and chemical agents were carried out.

INTRODUCTION

Mycotic affections have been reported from all domestic animals and birds in different parts of the world ROSEN, 1964, ALLER, 1967, and POLYA and BELEGH, 1971.

In Egypt, several studies concerning this problem among poultry were carried out, ABO-GABAL *et al.*, 1974, REFAI, 1976, ABO-GABAL *et al.*, 1977, and NARADI, 1978.

Most of the brain lesions described in the literature regarding the mycotic affections are inflammatory in nature, RAINES *et al.*, 1966, GEORG, BIERER and COOKE, 1964. Fibrinous air sacculitis, pneumonia and typical mycotic granulomas were the main pulmonary lesions described in turkey poult mycosis, KUNDTSON and MEINECKE, 1972, ZUBAIDY *et al.*, 1977.

The aim of the present work, was typing of fungal species present in upper Egypt, moreover to throw more light on the brain and lung lesions in experimentally infected poults, as well as the sensitivity of these strains against drugs and chemicals used in other parts of the world.

MATERIAL and METHODS

In the present work, 210 freshly dead and living turkeys of different ages and sources, (Table 1) from upper Egypt were studied. Crop and lung samples as well as tracheal swaps were subjected for mycological isolations. The isolates were cul ured on modified Sabourouds agar and subcultured till the colonies appeared. Morphological and microscopical identification of the isolates was carried out.

A. flavus suspension was made by adding 10 ml. fresh distilled water containing one drop of leconal as a weting to the culture, CHUTE and OMEARA, 1958.

Twenty, apparently healthy, three weeks old native breed turkey poults were obtained from Bani-Swaf Governmental turkey farm. Four poults were taken at random and subjected to post-mortem and mycological examinations. Eight poults were inoculated into the left abdominal air sac with 0.5 ml/ bird of the fungal suspension using 1 ml. syringe of 18 gaug needle. The other eight poults were kept as controls and each was inoculated by the same method with 0.5 ml. normal saline solution.

The infected poults were observed daily, during which symptoms and deaths were recorded. Post-mortem examinations were adopted on dead birds. Brain and lung specimens were taken for histopathological investigations. Trials for reisolation of the inoculated fungus were carried out. Moreover sensitivity of the fungus against nine drugs and chemical agents was tested.

RESULTS

In field cases, the most characteristic post-mortem lesions seen in the examined dead poults, brought for

mycological isolations were air sacculitis, congestion of the lungs and ulcer like lesions in the crop. the species, number and percentage of the isolated fungal species from both the apparently healthy and dead turkey samples and awaps are illustrated in table II.

In experimentally infected cases symptoms observed on all inoculated poult except the controls were more or less similar and included depression, ruffled feathers, off food, drooping of wings, transient diarrhoea and respiratory signs as gasping and rattling sounds. Those symptoms was followed by nervous manifestations in the form of torticollis, lack of equilibrium, incoordination of movement and paresis. Deaths occurred 1,4,6,7 and 8 days post-infection.

On post-mortem examination, the most obvious lesions were located in the brain and lung. Macroscopically, the brain revealed no specific alterations except hyperaemia of the meninges. The lungs showed severe pulmonary congestion and focal areas of consolidation in those poult died one and four days post-infection. In other poult many milliary sized, turbid greysh or even greyish white well defined nodules were detected. Most of the nodules were surrounded by hyperaemic zones and on cutting they showed centrally a fragmented, greenish, caseated material which could be easily removed.

On microscopic examination, the poult which died one and four days post infection showed meningitis. The meninges were thickened, hyperaemic zones and showed cellular infiltrations Fig. 1. In the other cases which later on, typical focal ischaemic and liquifactive cerebral necrosis was observed Fig. 2. The blood vessels in the affected areas showed intravascular thrombosis, moreover endvasculitis and some cases, hyalinization of the wall Fig. 3. Mycelia of the fungus could be seen in the area of malacia Fig. 4. In the cerebellum, demyelinating encephalitis could be observed Fig. 5.

Microscopical examination of the lungs in birds which died one and four days after infection showed diffuse serofibrinous pneumonia with heavy cellular infiltrations Fig. 6. In the other cases, two forms of pulmonary alteration were noticed, either a diffuse chronic productive inflammatory reaction in which great number of giant cells could be seen and the condition could be termed as giant cell pneumonia Fig. 7, or a focal granulomatous pulmonary form, in the latter, the nodules consisted of caseated central core surrounded by inflammatory cellular infiltrations and prepherally surrounded by a connective tissue capsule, Fig. 8. The surrounding alveoli showed pressure atelectasis with areas of compensatory emphysema.

Trials to determine the sensitivity of the isolated fungi to the fungicidal and chemical agents used, proved that all isolates were sensitive to mercuric iodide, Copper sulphate and thiobenzazol, while they were resistant to Erthromycine and Ematine Table III.

DISCUSSION

As reported by CHUTE 1978, lesions in aspirogilosis depend considerably on the site of infection. Frequent occurrence of lesions in the lungs in spontaneously affected cases showed the importance of inhalation as a route of infection under field conditions. Also, as revealed by experimental inoculation of *A. flavus* in the abdominal sac in the present study, the lung was the organ mostly severely affected. Microscopically, the lesion consisted of either focal or diffuse productive inflammation which developed relatively rapid that it can be observed as early as the first week of infection. These results are parallel to those of many investigators who recorded the occurrence of granulation reaction due to aspirogilosis in the lung, KURASEVA, 1966, ADAMESTREANU *et al.*, 1969, KUNDTSON and MEINECKE, 1972. Giant cells were also frequently observed, both in the lung, KUNDTSON and MEINECKE, 1972 and brain REINES *et al.*, 1966.

The present study revealed, moreover, that inoculation of *A. flavus* in the abdominal air sacs can be followed by a generalized infection, this is indicated by the presence of pathological lesions and hyphae in the brain. It can be suggested that after reaching the lung through the air sacs the fungus gain access to the brain most probably by invasion of the alveolar walls, interalveolar capillaries then to the blood circulation.

Lesions in the brain was related more to a local circulatory disturbance, resulting from damage of the vascular bed than to a direct effect of the mycotoxin.

PNEUMONIA and ENCEPHALOMALACIA

Culture growth of the fungus, *A. flavus* could be inhibited in vitro by mercuric iodide, copper sulphate and thiobenzazol. CISZEWSKI, 1968 reported the advantage of copper sulphate in drinking water as a treatment of aspirogilosis in ducklings. KLIMES and KRIZ 1968 mentioned that thiobenzazol could be used as a preventative therapy for chickens. SAIF and REFAI 1977 successfully used thiobenzazol for control of moulds in poultry farms.

REFERENCES

- Abou-Gabal, M.G., Malik, N., and Enabs, (1974): Investigations on dermatitis in chickens. Abst. of papers presented to 55 th annual meeting of the confernece of Research workers in Animal Disease. Cigage, Illienis, Dec., 1974.
- Abou-Gabal, M.G., Enab, S.M., and Agroudi, M.A. (1977): Studies on the incidence of pathogenic fungi in poultry. *J. Egyptian Vet. Med. Asoc.*, 36, 90-102.
- Adamesteanu, I., Adamesteanu, C., and Baba, I.P., (1969): An outbreak of acute aspergillosis in fowl. *Annis. Med. Vet.*, 113, 302-307.
- Aller, B., (1967): Fungi in the upper digestive and respiratory tract of hens "*Gallus domesticus*". *Brit. Vet. J.*, 123, 431-435.
- Chute, H.L., (1978): Fungal infections. In Hofstod, M.S., Calnek, B.W., Helmboldt, C.F., Reid, W.M., and Yoder, H.W.Jr.: *Diseases of poultry*, 7th ed., Iwa state Uni. Press, pp. 367.
- Ciszewski, K., (1978): Efficacy of copper sulphate in the treatment of aspergillosis in ducklings. *Medycyna Wet.*, 24, 150-151.
- Georg, L.K., Bierer, B.W., and Cooke, W.B., (1964): Encephalitis in turkey poults due to a new fungus species. *Sabouroudia*, 3, 239-244.
- Klimes, B. and Kriz, H. (1968): Preventative therapy of chicken aspergillosis with thiobenzazole. *Acta Uni. Agric. Fac. Vet.* 37, 233-237.
- Kundtson and Meincke, C.F. (1972): Pheumonic Aspergillosis in poults caused by *A. flavus*. *Animal Dis. Res. and Diag. Lab. South Daketa state Uni. Breekings*, 27, 1972.
- Kuraseva, V., (1966): Influence of toxic and pathogenic aspergilli in the food on the occurrence of pulmonary aspergillosis in fowls. *Trudyvses. Inst. Sanit.*, 26, 140-143.
- Nafady, A.A. (1978): Pathologicalabstudies on Aspergillosis in poultry. Thesis, M.V.Sc. Fac. Vet.Med. Assiut Uni.
- Polya, V., Balegh, T. (1971): Cerebral aspergillosis in geese and turkeys. *Allatervosek Iapia*, 26, 307-310.
- Raines, T.V., Kuzdas, C.D., Winkel, F.H., and Johnson, B.S., (1966): Encephalitic aspergillosis in turkeys a case report. *J. Am. Vet. Med. Asoc.*, 129, 436.
- Refai, M., (1976): On the incidence of moulds in the poultry industry and determination of pathogenicity and disinfection trials. *Poceeding of mycological congress Frankfurt*.
- Rosen, M.N., (1964): Aspergillosis in wild and domestic fowl. *Avian Dis.* 8, 1-6.
- Saif, A. and Refai, A., (1977): The use of thiobenzazol to control moulds in poultry farms. *Castellania*, 5, 185-187.
- Zubaidy, A.J., Abul-Azm, I.M., Abdallah, I.S., and Zaffer, S.A.N., (1977): Avian aspergillosis in Iraq with special reference to the pathology of the fungal mycetoma in Turkeys. *Assiut Vet.Med.J.*, 4, 114-117.

DESCRIPTION OF FIGURES

- Fig. 1: Showing meningitis. H. & E. (X 250).
- Fig. 2: Brain showing focal ischaemic liquifactive necrosis. H. & E. (X 160).
- Fig. 3: Cerebral blood vessel showing intravascular thrombosis and vasculitis. H. & E. (X 400).
- Fig. 4: Showing mycelia of the fungus in the brain tissue. H. & E. (X 400).
- Fig. 5: Cerebellum showing demylination. H. & E. (X 160).
- Fig. 6: Lung showing serofibrinous pneumonia. H. & E. (X 160).
- Fig. 7: Lung showing diffuse productive inflammation. H. & E. (X 400).
- Fig. 8: Lung showing focal productive inflammation. H. & E. (X 400).

A.H. BAYOUMI, *et al.*

Table (I)

Showing the frequency, age, breed, state, and sources of the examined samples.

Frequency of samples.	Age	Breed.	State of samples	Source
160	1-4 weeks	White indeco	Freshly dead	El-Wadi El-Gadid Govern- mental Turkey Farm.
50	8-12 months	Native	Living. apparently healthy	Popular flo- cks from kens prov- ince.

Table (II)

Showing species, number and percentage of isolated fungi.

Species.	Number of isolated fungi.			Total	Percentage to total isolates
	Crop.	Lung.	Tracheal swabs.		
<i>A. funigatus.</i>	28	40	4	72	24
<i>A. flavus.</i>	18	10	1	29	9.6
<i>A. niger.</i>	13	19	16	48	16
<i>A. flavipis.</i>	20	3	3	26	8.6
<i>Penicillium spp.</i>	--	41	-	41	13.6
<i>Mucor spp.</i>	16	5	2	23	7.6
<i>Rhizopus spp.</i>	--	4	-	4	1.3
<i>Paecilomyces</i>	8	3	-	11	3.6
<i>Scopulariopsis</i>	6	3	2	11	3.6
Yeast and yeast-like fungi.	21	12	2	35	11.6

PNEUMONIA and ENCEPHALOMALACIA

Table (III)

Showing the effect of Fungicides & Chemical agents on isolated fungi

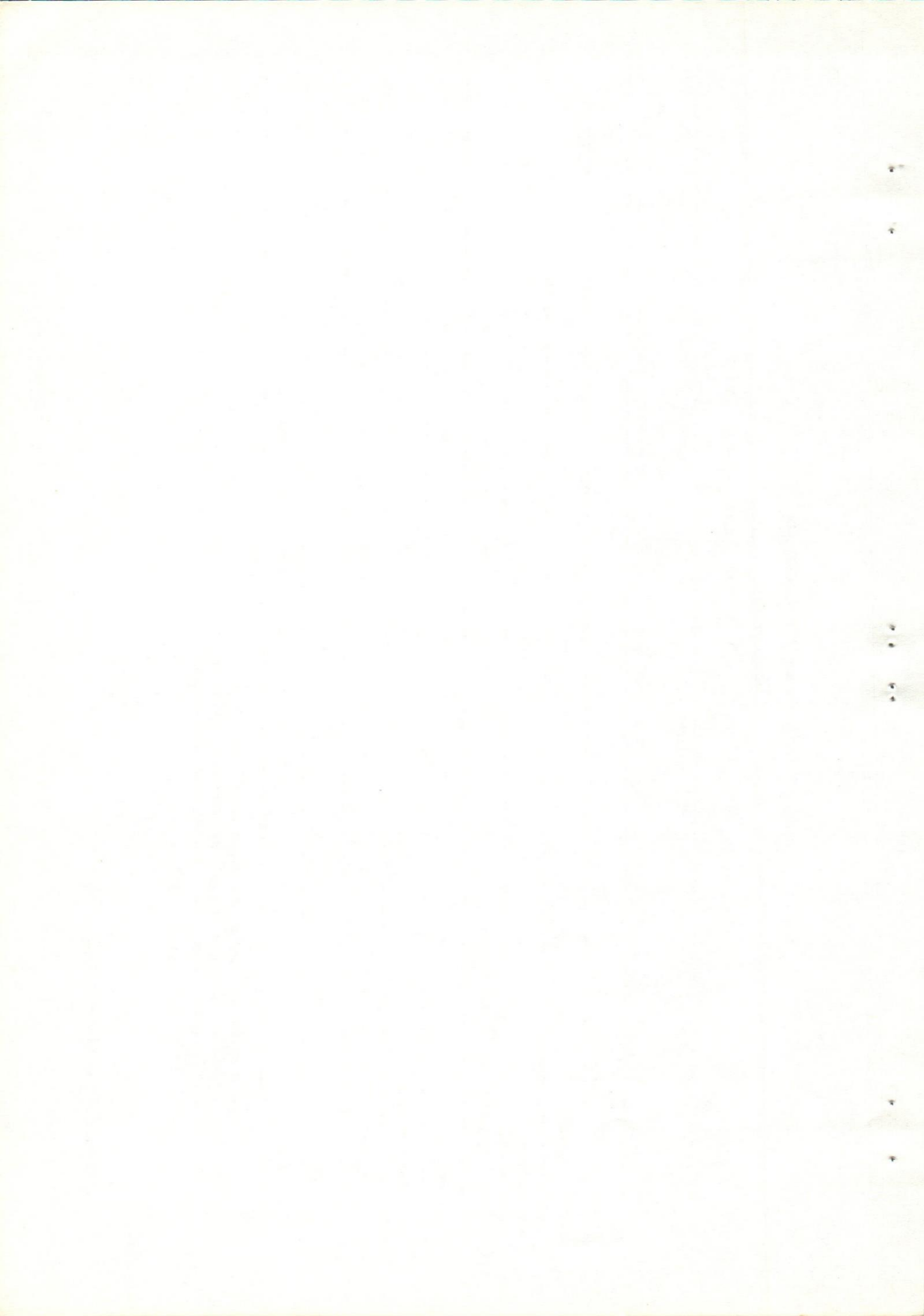
Species of fungi	Erythro- Mycin 50 mg/ml	Pot. iod- ide 20 mg/ml	Mer. iodide 10 mg/ml	Emetine 6 mg/ml	Cop. Sulphat 20mg/ml	Chlora- mphenicol 20 mg/ml	Nystatine 80 i.u./ml	Grisea- fulvine 16 mg/ml	Thiobend- azol 2.5 mg/ml
<i>A. fumigatus</i>	---	---	++	---	++	+	+	+	++
<i>A. flavus</i>	---	---	++	---	++	+	+	-	++
<i>A. niger</i>	---	+	++	---	++	+	+	-	++
<i>A. flavipis</i>	---	-	++	---	++	+	+	+	++
<i>Paecillomyces</i>	---	-	++	---	++	++	+	+	++
<i>Scopulariopsis</i>	---	-	++	---	++	+	+	-	++
<i>Rhizopus</i>	---	-	++	---	++	++	+	-	---
<i>Mucor</i>	---	-	++	---	++	---	+	+	+
<i>Penicillium</i>	---	++	++	---	++	++	++	++	++

++ : Complete inhibition of Culture growth.

+ : Moderate growth of the culture (Moderate inhibition).

- : Complete or heavy growth of culture (No inhibition).

Abd el Galil, et al., (1972).



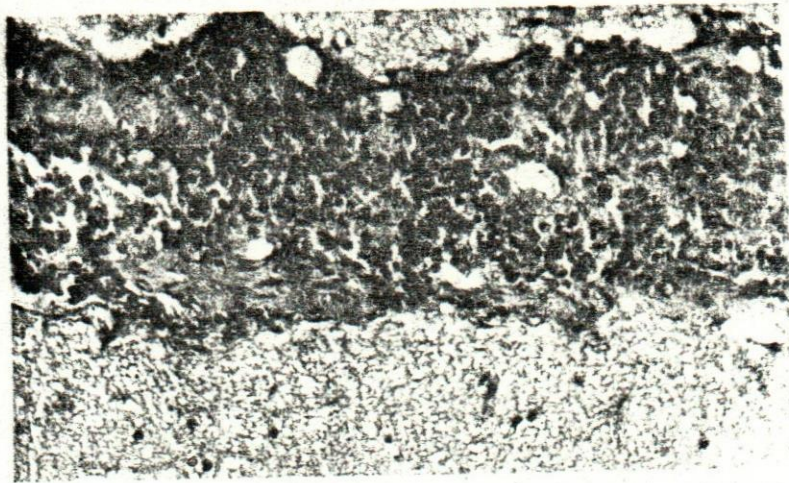


Fig.:(1).

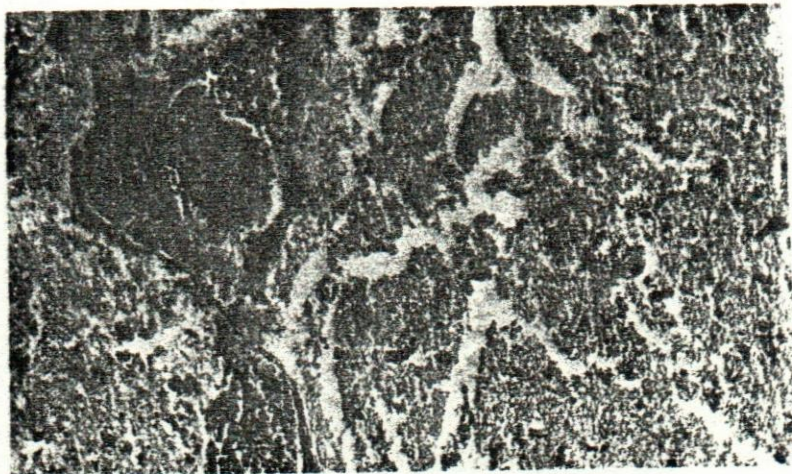
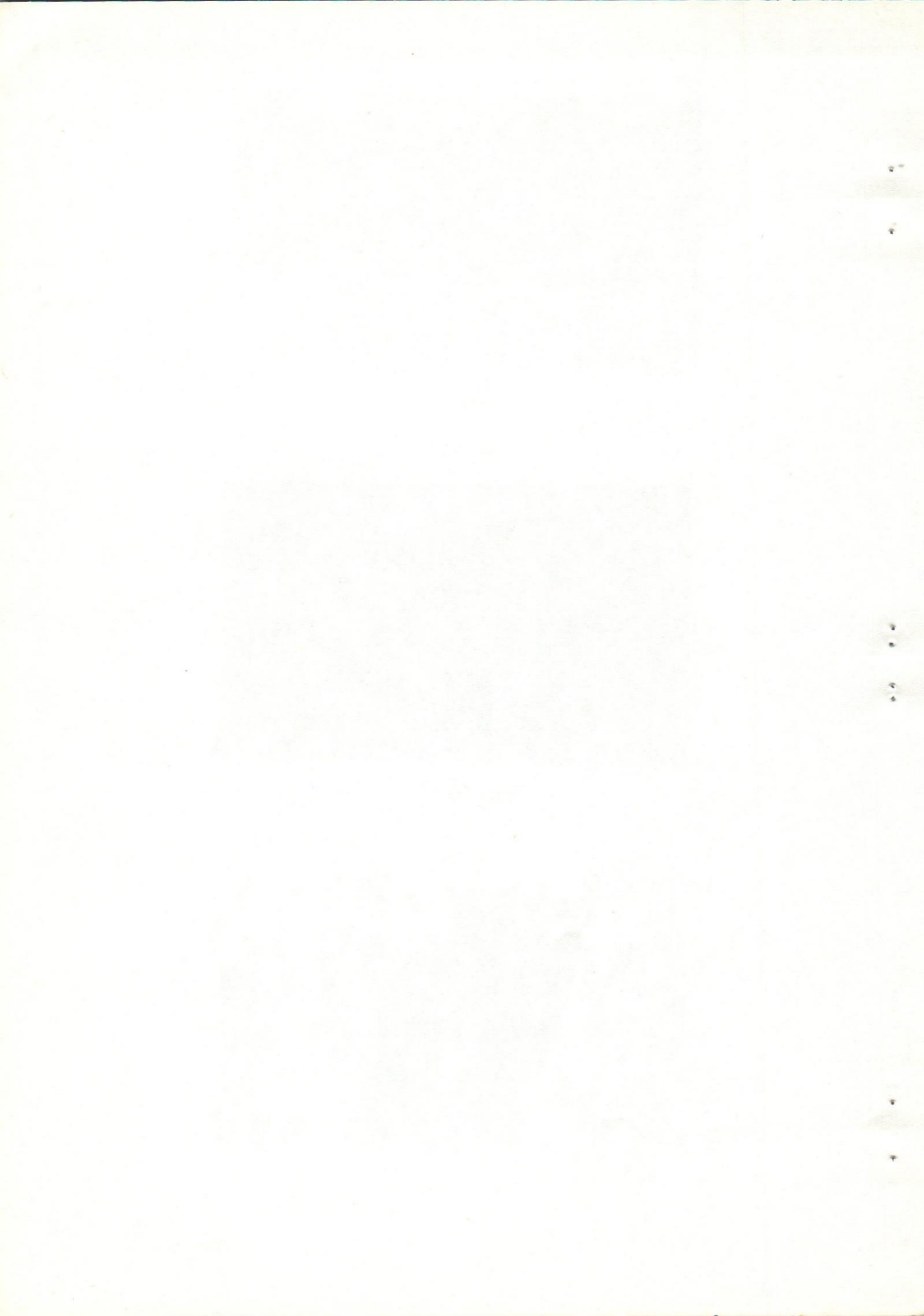


Fig.:(2)



Fig.:(3)



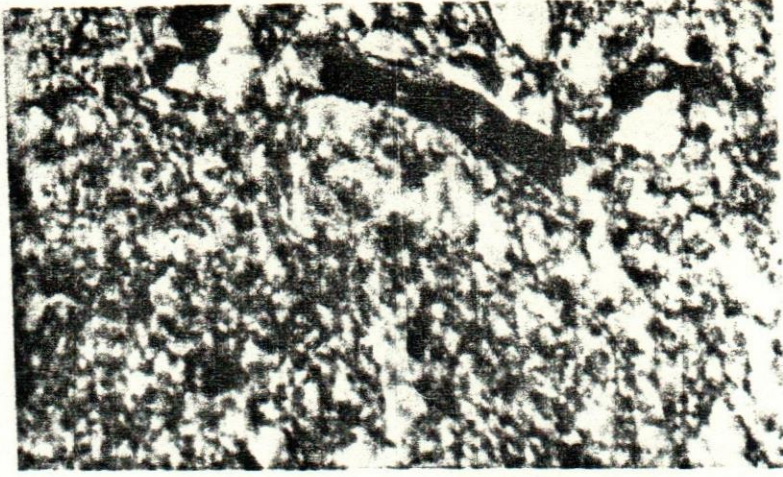


Fig.: (4)

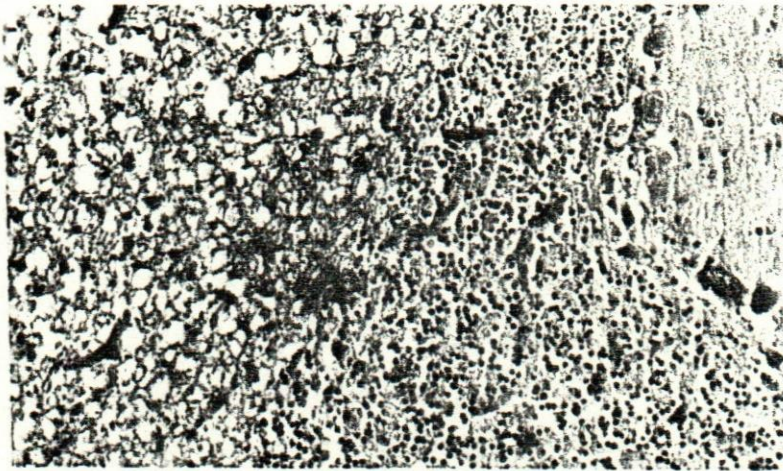


Fig.: (5)

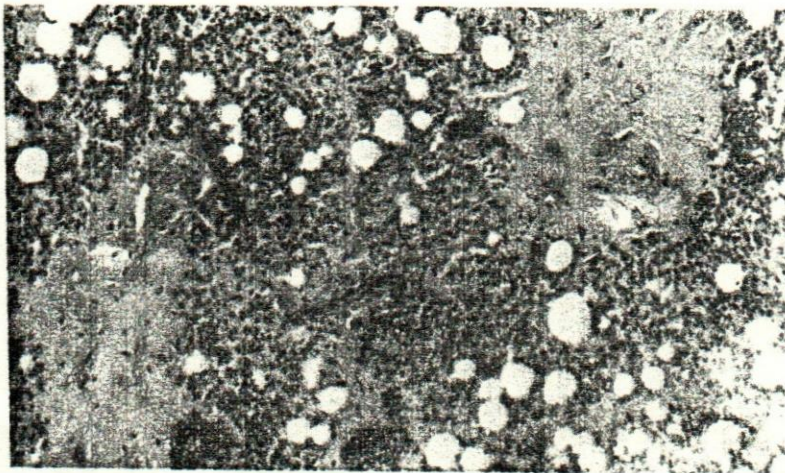
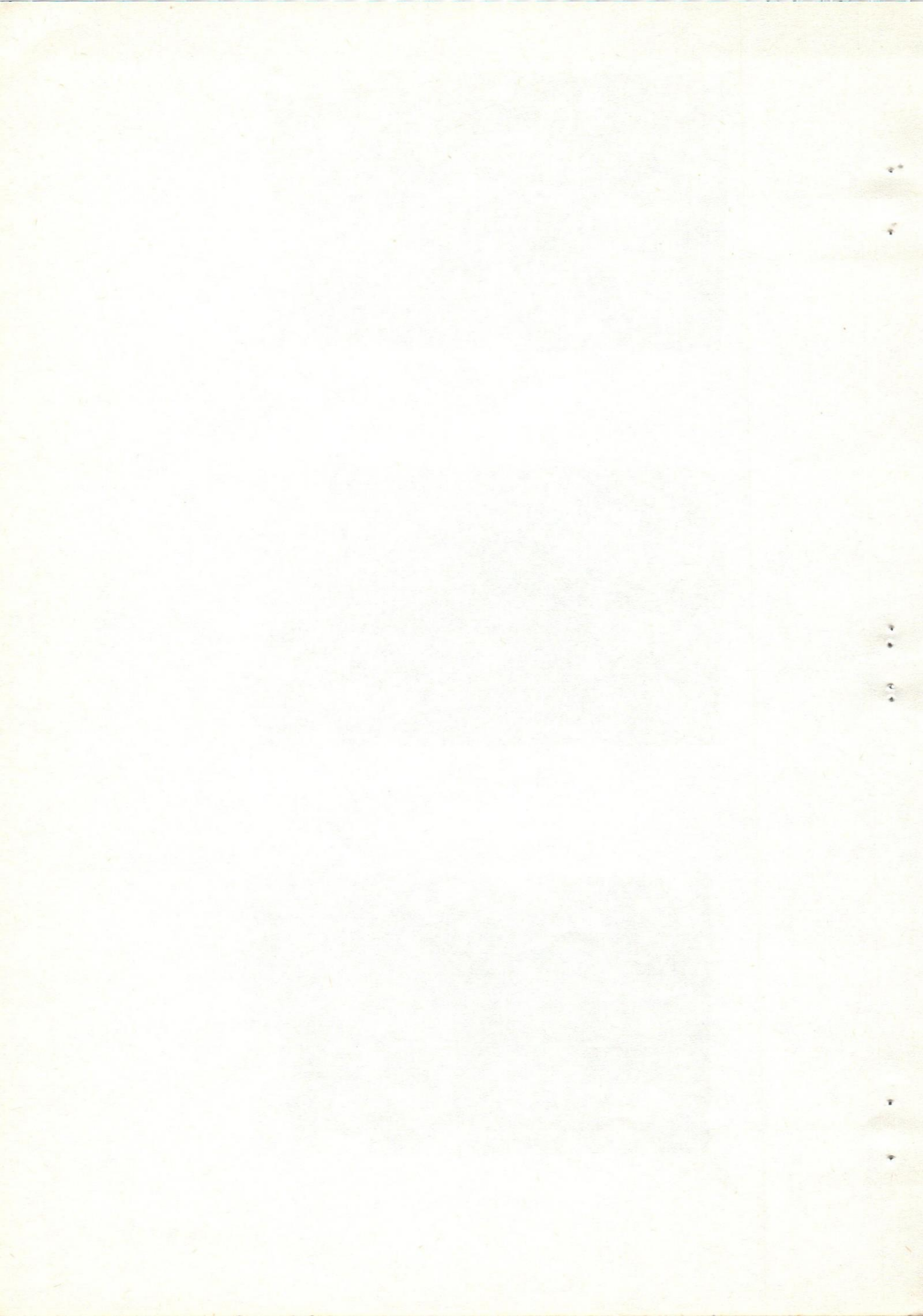


Fig.: (6)



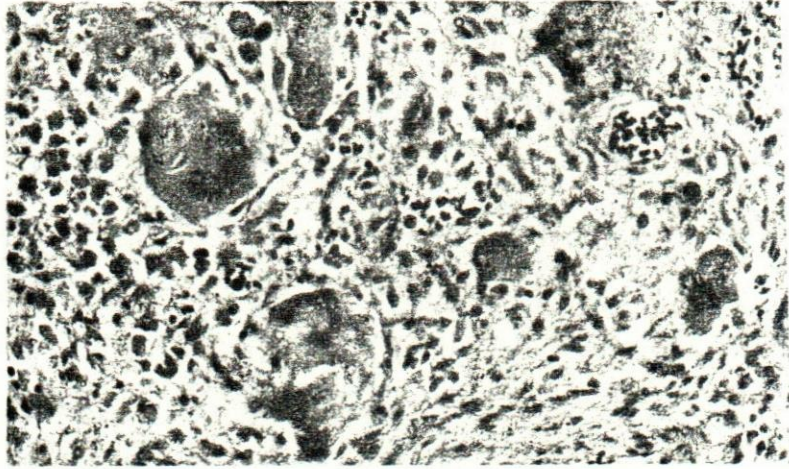


Fig.:(7)

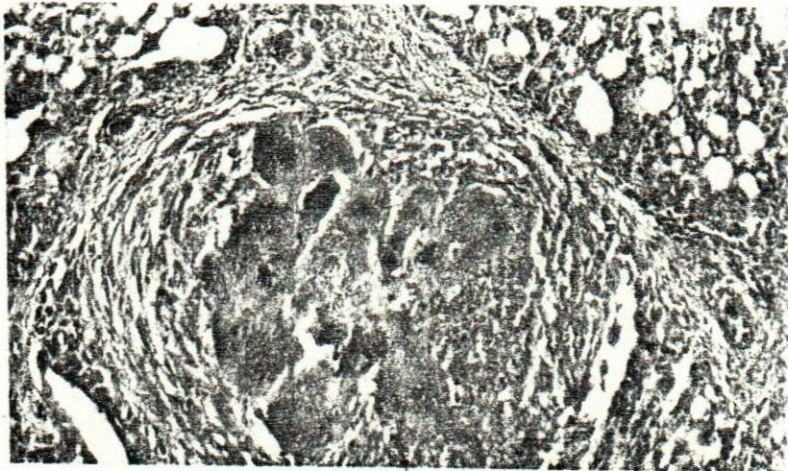


Fig.:(8)

