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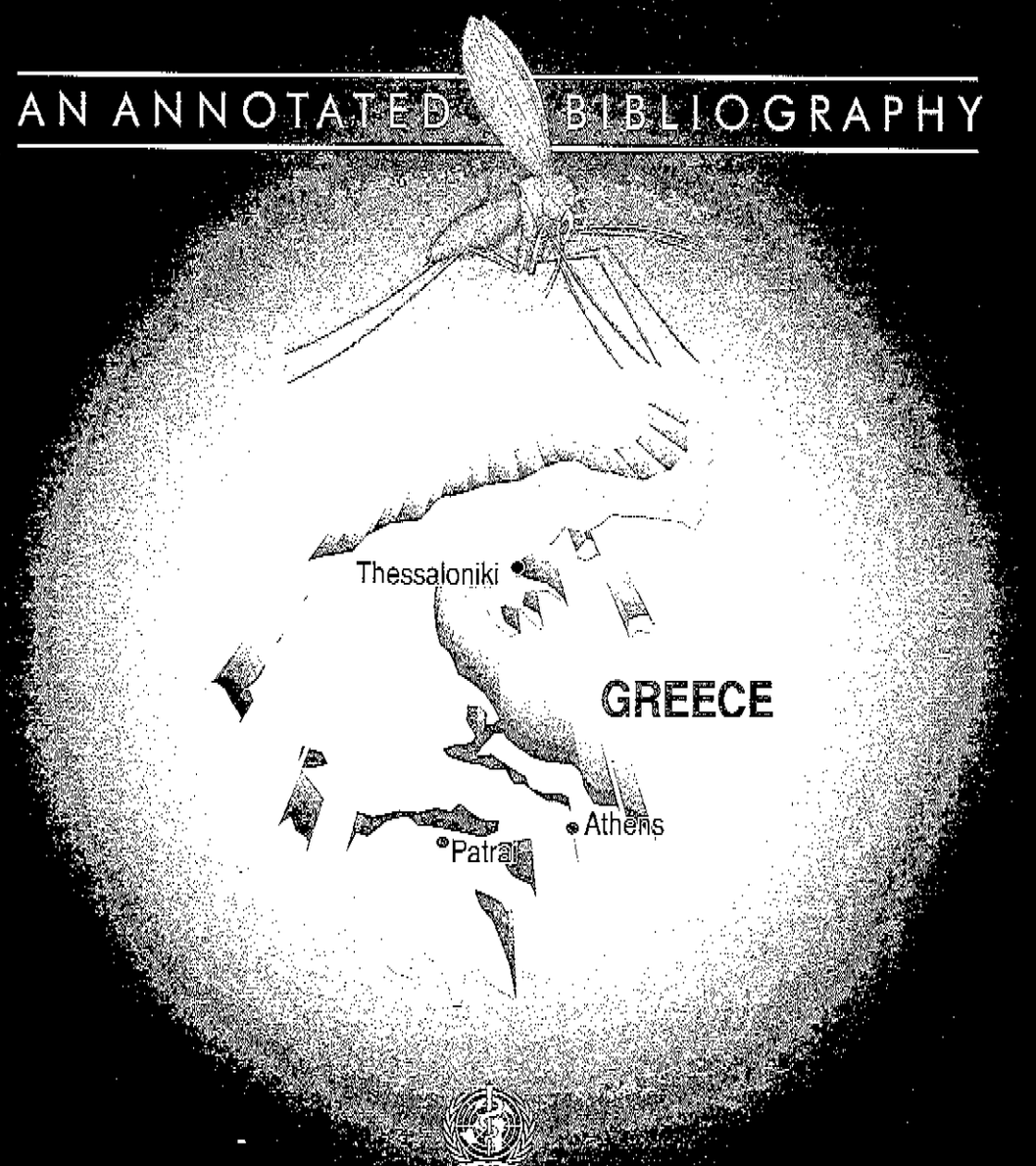

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LEISHMANIASIS, SANDFLY FEVER AND PHLEBOTOMINE SANDFLIES IN GREECE :

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INTRODUCTION

The best way to describe leishmaniasis, sandfly fever and phlebotomine sandflies is to call them an esoteric subject which has attracted the attention of investigators with an eye for difficult, unusual and challenging tasks. Although the parasites causing leishmaniasis were first discovered in 1885 and named *Leishmania* in 1903 (31,142), the disease had been described in Greece under different names much earlier. The first reports of kala-azar (called Ponos) were from the island of Spetses in 1835 (1,2) and are regarded as the earliest records of the disease in the Mediterranean region. In 1882 and 1883 kala-azar was again described on the island of Hydra under the name "Tsanaki" with unknown etiology (3).

Interest in leishmaniasis in Greece began in the early part of this century with publications by Cardamatis, Aravantinos, and a few other physicians. It continued later with Caminopetros, Blanc, Langeron, Adamopoulos, Papantonakis, Papadakis, Adler and Theodor, and Parrot. These were the pioneers who provided the impetus and established the foundation on which others built later.

The use of DDT and other modern insecticides to combat malaria after World War II, diminished the importance and thus the interest in sandfly-transmitted diseases. When reports of Kala-azar in children and dogs appeared frequently in the 1970s and 1980s, a new awakening on the subject occurred. Briefly, review of the subject leads to the following conclusions.

- There exist 2 forms of leishmaniasis in Greece: Visceral (VL) and Cutaneous or Dermal (CL). The viral disease known as sandfly, 3-day, or *papatasi* fever is also present.

- VL or kala-azar seems to be present in practically all geographical areas of Greece, both continental and insular. It is caused by *Leishmania infantum* and primarily affects infants and young children. This form of leishmaniasis is a zoonosis with the domestic dog as its reservoir host. *Phlebotomus neglectus* is assumed to be a vector based on isolations of *L. infantum* from female sandflies on the islands of Zakinthos (214) and Corfu (205).

- CL is the other form of the disease which appears to be endemic in the Ionian islands, Crete, southern Peloponnese and Central Greece. (63, 133, 159, 188). It is caused by *L. tropica* and, unlike VL, it is considered anthroponotic since no animal reservoir host (s) has been implicated in the cycle of transmission. The vector of CL is listed as *P. sergenti* (123, 216) but few attempts to find the parasite in sandflies in Greece have failed to confirm this.

- Sandfly fever (SF) is the third disease transmitted by sandflies in Greece. It has attracted little attention from investigators due to lack of awareness and means to properly diagnose it. The present status of SF is speculative. A serological survey of 637 sera from residents of Athens 30 years of age or older in 1977 showed a prevalence of 36% and 13% positive for Naples and Sicilian serotypes, respectively (157). SF has no known animal reservoir hosts, it is transmitted by

P. papatasi (8,41) and is maintained in nature by transovarial transmission of the vector (89).

■ Phlebotomine sandflies (*Diptera: Psychodidae*) are small biting flies with wide distribution in Greece. There are 12 known species in the country, 9 in the medically important genus *Phlebotomus* and 3 in the genus *Sergentomyia* (197, 198, 199).

The papers in the bibliography are reviewed as Abstracts or Summaries. Abstracts are provided by the author(s) of the original articles or reviewers such as those in Tropical Diseases Bulletin and the Review of Applied Entomology. Summaries are prepared by the authors of this publication.

The bibliography includes numerous articles published in Greek journals which titles have been generally translated into english:

English Title	Greek Title
Acta Medica Hellenica	Elliniki Iatriki
Acta Microbiologica Hellenica	Deltion Ellinikis Microviologikis Eterias
Acta Societatis Paediatricae	Arkhia Ellinikis Hellenicae Pediatrikis Eterias
Aesculapius	Asclipios
Annales Clinicae Paediatricae	Deltion Pediatrikis
Universitatis Athenicnsis	Clinikis Panepistimiou Athenon
Annales Medicales	Iatrika Khronika
Applied Clinical Microbiology and Laboratory Diagnosis	Efirmosmeni Cliniki Microviologia ke Ergastiriaki Diagnostiki
Archives of Hellenic Medicine	Arkhia Ellinikis Iatrikis
Archives of Medicine	Arkhia Iatrikis
Archives of the Pediatric Clinic of the University of Athens	Arkhia Pediatrikis Klinikis Panepistimiou Athinon
Bulletin of the Hellenic Pediatric Society	Deltion Ellinikis Pediatrikis Eterias
Bulletin of the Hellenic Veterinary Medical Society	Deltion Ellinikis Ktiniatrikis Eterias
Bulletin of Social Welfare and Health Statistics	Deltion Statistikis Kinonikis Pronias ke Iyinis
Galenus	Galinos
Medical Progress	Iatriki Proodos
Medical Science-Practice	Iatriki Epistimi-Praxis
Pediatrics	Pediatriki
Proceedings of the Medical Society of Athens	En Athines Iatriki Eteria Practika
Review of Recent Medical Literature	Iatriki Vivliografiki Enimerosi

Older publications refer to species of phlebotomine sandflies with names which are not anymore valid. It is therefore necessary to show the synonimies of the old and the new names.

Old name	New name
P. papatasii	*P. papatasi*
P. sergenti var. *alexandri*	*P. alexandri*
P. major	*P. neglectus*
P. perniciosus	*P. tobbi*
P. perniciosus var. *tobbi*	*P. tobbi*
P. macedonicus	*P. perfiliewi*
P. larroussei	*P. mascittii*
P. chinensis var. *simici*	*P. simici*
P. chinensis var. *balcanicus*	*P. balcanicus*
P. chinensis	*P. simici* or *P. balcanicus*
P. bruchoni	*S. dentata*
P. parroti var. *italicus*	*S. minuta*
P. parroti	*S. minuta*
P. minutus	*S. theodori*
P. vesuvianus	*P. mascittii*

BIBLIOGRAPHY
(In Chronological Order)

1. **Karamitsas, G., 1879. Ponos of Spetses. Galenus, Year 1 (No.5):65-71 (*in Greek*)).**

Summary: The author presents the history of "Ponos" and "Tsanaki" in Spetses and Hydra, respectively. Ponos in Spetses was a disease attributed to the rain water collected and kept in tanks (cisterns). On a visit to the island and with the help of the local physician C. Yiannopoulos the author had the opportunity to examine 2 sick children and concluded that they were cases of pseudo-leukemia or splenic cachexia. It was said that in Spetses old men died from tuberculosis and children died of Ponos. The disease was encountered in some families and not in others. It affected children of both sexes, both poor and well-to-do. Although, rain water in tanks was suspected as being the cause, the fact that the disease did not occur on other islands, where rain water was similarly used, contradicted the theory. Symptoms of the disease are described, with splenomegaly being the main characteristic in all cases. The duration of Ponos was estimated to be 8 to 18 months and its prognosis bad. No treatment was available and thus parents considering the illness not treatable did not seek medical attention in most cases. Physicians, however, prescribed quinine and preparations of iron, especially those containing iodine.

2. **Yiannacopoulos, K., 1879. On some endemic diseases on the island of Spetses. A. On Ponos. Galenus, Year 1, (No.31):65-68; (No.32):85-88; (No.34):113-116; (No.35):132-135; (No.36):149-153 (*in Greek*)).**

Summary: An extensive account of the disease known as Ponos (pain) on Spetses is presented by the local physician. Old men on the island tell how Ponos killed large number of children when they were young. It was impossible, they said, to have a family without losing one or more children. In nine out of ten cases the illness occurred in children after the first year of life and rarely in adults. The local people attributed Ponos to the weak nature of parents and especially to the lactating mother. Others believed that teething caused the illness. In some families all children were affected and to prevent further spread they burned all the clothes of the ill children. Still others thought that the illness was syphilitic since syphilis was a common disease in the adults of the island. The author called Ponos a peculiar malarious dyscrasia and goes on to explain his reasoning. He also describes symptoms, duration, course, anatomical changes, frequency, diagnosis, prognosis and treatment of the illness. Histories of 5 cases are described and various treatments which include quinine, iron, bismuth, tonics, oil of eucalyptus, etc. are included.

3. **Parissis, N.P., Tetsis, J.A., 1881. La maladie endémique des enfants à Hydra appelée Tsanaki, In: De l'île d'Hydra (Grèce), au point de vue médical et particulièrement du Tsanaki. Imprimerie Moquet, Paris.**

Summary: In pages 33-60 of the treatise on the medical problems in the island of Hydra, the authors discuss thoroughly the illness known by the local people as Tsanaki. The word Tsanaki means a small earthenware jar or pot in which food items are kept and in this case denotes the swollen spleen which characterizes the disease. The illness has a course and symptoms which can be divided into 2 periods. The symptoms of the first period are anemia, fever and a swollen spleen and those of the second period include hemolysis, nervous disorders, gastric troubles, noma, abscess, etc. The frequency of Tsanaki in Hydra is 1/1000 infants. The etiology is ascribed to causes such as contaminated potable water, malaria, splenic anemia, pseudo-leukemia, scurvy, etc. The authors, however, think that Tsanaki is an illness of tuberculoid nature which agrees with the opinion of the junior author for the disease Ponos in Spetses. Both authors firmly believe that Tsanaki of Hydra is the same disease with Ponos of Spetses which was first reported to the Medical Society of Athens by Roeser on October 15, 1835.

4. **Tetsis, I.A., 1881. Tsanaki or putrefied illness of children in Hydra. Galenus, 3 (No.21):369-375; (No.25):385-391; (No.26):411-415; (No.27):1-7 and 22-25 (*in Greek*)).**

Summary: In a series of articles the author details all aspects of the illness of children known as Tsanaki on the island of Hydra. The account incudes history, anatomical changes, symptoms (divided into 2 periods), complications, forms, etiology, duration, course, evolution and prognosis of illness. In the last 2 parts (No.27) the author describes 12 cases of Tsanaki, each one with a different combination of symptoms, such as mild form with splenomegaly, mild form without splenomegaly, splenomegaly complicated by peritonitis, malignant form with mouth gangrene, etc. The author proposes to name the illness hemolysis or putrefied disease and he describes it as chronic characterized by anemia, fever, splenomegaly and hemolysis.

5. **Alivizatos, P.G., 1901. Splenic anemia in children. Medical Progress 6:180.**

Summary: The author reports cases of kala-azar in Cephalonia and thus disputes the prevailing theory that the disease occurs only on the islands of Spetses and Hydra. In Cephalonia, kala-azar is found mainly in villages with high humidity and lack of sunshine. It is common in young children between the first and second teething, and the main symptom is progressive anemia. Genetic predisposition, bad nutrition, mumps, measles, whooping cough, malaria and poor living conditions are factors contributing to the development of the disease. Kala-azar may last up to 20 months and ends with death of the patient.

6. **Cardamatis, J.P., 1909. Leishmaniose en Grèce (Bouton d'Orient). Bulletin de la Société de Pathologie Exotique 2:257-261.**

Summary: First report of Oriental sore in Crete, which is believed to have been introduced to the island by Turkish soldiers in 1836. The author describes 2 cases in young boys with ulcers in the chin, cheek and nose. Microscopic examination of pure pus from the ulcers shows presence of numerous parasites in epithelial cells. Most parasites are extracellular. Preparations of pure serum contain only rare fusiform parasites whereas preparations of serum and blood contain still smaller number of parasites.

7. **Cardamatis, J.P., 1909. Observations microscopiques sur un Bouton d'Orient non-ulcéré. Bulletin de la Société de Pathologie Exotique 2:391-392.**

Summary: Microscopic observations of a non-ulcerating case of Oriental sore are presented. Blood preparations showed large numbers of young parasites. Most are spindle-shaped in form and rarely round. Almost all parasites are extra- cellular and isolated, rarely in groups of 3 to 5. The intracellular parasites are rare, the cells containing usually one, rarely two parasites. The proliferation of parasites begins with division of the nucleus. Hematologic examination shows 84% mononuclear WBCs, 16% polynuclear neutrophils and 0% eosinophils.

8. **Birt C., 1910. *Phlebotomus* fever in Malta and Crete. Journal of the Royal Army Medical Corps 14:236-258.**