mechanical transmission of the spirochaetes by eye flies

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Yaws(frambesia) is a spirochetal disease indistinguishable from syphilis with blood tests. It is caused by Treponema pertenue.
Treponemataceae is the name of the family of spiral organisms belonging to the order Spirochaetales; includes the genera Borrelia, Leptospira, and Treponema.(Taber's)

".... In the case of Yaws, mechanical transmission of the spirochaetes by eye flies (Hippelates pallipes) in the West Indies is thought to be most likely. ..."

TITLE: Pathogen transmission in relation to feeding and digestion by haematophagous Arthropods.
AUTHORS: Langley PA
SOURCE: Acta Trop 1975;32(2):116−24
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ABSTRACT: The blood feeding habit, especially among opportunist feeders such as tabanids and Stomoxys is known to result in transmission of diseases for which the vectors are not the obligate or alternate hosts. Thus, mechanical transmission of trypanosomes such as T. vivax can occur in cattle herds outside tsetse fly areas where tabanids are actively feeding. In the case of Yaws, mechanical transmission of the spirochaetes by eye flies (Hippelates pallipes) in the West Indies is thought to be most likely. The spirochaetes remain motile in the pharynx and oesophageal diverticula for several hours but are apparently immobilised in the midgut (Kumm & Turner, 1936). There is apparently no development ofspirochaetes in the fly. They have been shown to pass through houseflies, but in mechanical transmission, biochemical transformation or adaptation of the pathogen is not implied. Virus transmission is common among arthropods and transovarial transmission to succeeding generations is frequent in mites and ticks. Although Yellow Fever virus is not transovarially transmitted by its vector Aedes aegypti, the mosquito only becomes infective some time after ingesting an infected blood meal (Chandler, 1955). Thus, metabolic or biochemical changes or adaptations in the virus or in the vector are in some way implicated, as they must also be in transovarially transmitted viruses. However, the causal relationships between virus infectivity and vector physiology are poorly understood. As with virus infections, those disease

organisms possessing a cyclical host/vector relationship will possess a variable infectivity potential which is not necessarily related to the abundance of any of the organisms in the cycle. Clearly, feeding behavior and host preferences of the vector are important in determining the rate and extent of disease transmission, and such parameters can be quantified in epidemiological studies. However, a complete understanding of the factors concerned in cyclical disease transmission also depends on a knowledge of the physiology of the organisms involved, and particularly of the interdependence of their physiologies. The subject is vast, and it is proposed to illustrate the problems involved and the progress made, by reference largely to trypanosome transmission by tsetse flies (Glossina spp.).MAIN MESH HEADINGS:
*Arthropod Vectors
Arthropods/*physiology
*Digestion
*Feeding Behavior
Trypanosoma/*physiology ADDITIONAL MESH HEADINGS: Adaptation, Physiological
Animal
Arthropods/metabolism
Arthropods/parasitology
Blood
Cattle
Comparative Study
Female
Human
Male
Species Specificity
Support, U.S. Gov't, Non−P.H.S.
Trypanosoma/isolation & purification
Trypanosoma/pathogenicity PUBLICATION TYPES: JOURNAL ARTICLE LANGUAGES: Eng