4. Important vectors related to parasitic diseases in tropical areas
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There are many arthropods playing as vectors or transmitters of human parasites in the world, especially in tropical areas. According to their relationship, they are classified as followings:

1. Play a role as the final host of the parasite
Anopheline mosquito is the final host of malaria parasite. It is estimated that about 500 million people contracted malaria each year. In Taiwan, malaria control started in 1946 with DDT house spraying. In 1965, malaria was successfully eradicated.

2. Play a role as the intermediate host of the parasite
Culicine mosquito plays the role of infection of lymphatic filariasis. There are about 90 million patients distributed in Southeast Asia and Africa. In Taiwan and Pescadores, bancroftian filarial cases were treated with diethyldicabamazine (DEC). In Kinmen (Quemoy Islands), distribution of DEC medicated salt to inhabitants and military personnel had been carried out. Lymphatic filariasis was eradicated from Taiwan areas in 1981. Malayan filariasis is transmitted by *Mansonina* mosquitoes. It is distributed in eastern Asia, southwestern Pacific Islands and parts of India. Dirofilariasis is mainly caused by *Dirofilaria immitis*, and is transmitted by culicine mosquitoes. Human pulmonary dirofilariasis appears increasing its distribution in the world. A few cases had been proved in Taiwan. River blindness caused by *Onchoerca volvulus* is widely distributed in tropical Africa, Arabian Peninsula and Latin America. About 120 million persons are living in these high risk areas. The disease is transmitted by black flies. A few imported cases had been diagnosed in Taiwan. Leishmaniasis cause visceral, cutaneous and muco-cutaneous leishmaniasis. Sand flies transmit the diseases from animals or from human. About 12 million people are estimated to be infected. The distribution of visceral leishmaniasis is in China and Middle Asia; cutaneous leishmaniasis, in Asia, Middle East and Latin America; and muco-cutaneous leishmaniasis, in Latin America. African trypanosomiasis or sleeping sickness is transmitted by tsetse flies. There are about 55 million persons residing in the risk area of tropical Africa. The causative parasites include *Trypanosoma brucei gambiense* and *T. b. rhodesiensese*. American trypanosomiasis-Chagas’ disease is caused by *T. cruzi*. It is mainly endemic in Latin America, 18 million people are estimated too be infected. The triatomine bugs are responsible for transmitting the disease. Some species of fleas may transmit certain cestodiasis, such as hymenolepiasis and dipylliasis. *Cyclops incriminates* as the intermediate hosts of *Dracunculus* and *Gnathostoma*.

3. Play a role as the first intermediate host of the parasite
*Diphyllobothrium latum* and *Spirometra* sp. require two intermediate hosts. *Cyclops* is serving as the first intermediate host.

4. Play a role as the mechanical disseminator
Since cockroaches feed on feaces, they may disseminate ameba and parasite eggs with the fecal-oral route. *Entameba histolytica* cysts were found on cuticle and/or in the digestive tract of cockroaches, which may play a role as potential mechanical disseminators.