ACCIDENTAL HUMAN PHILOPTHALMIASIS IN THE PHILIPPINES

By Carmen C. Velasquez, Academician

Referred to me for diagnosis were 3 flukes out of 6 removed from the eye of a woman from Ilocos Norte admitted for treatment in the North General Hospital in Manila. The patient complained of lacrimation and purulent exudate for three years. The specimen were stained in borax carmine and mounted in permount. Although the specimens were damaged due to improper method of removal, diagnosis was possible. The trematodes belong to the genus *Philopthalmus* Looss, 1899. This finding constitutes the first case of human philopthalmiasis in the Philippines and the third in the world.

Microphotographs and camera lucida drawings were made. Measurements are in mm unless otherwise stated. Averages are in parentheses.

Philopthalmus III

Diagnosis (based on 3 specimens); Body elongate 5.03 to 9.48 (7.2) long by 1.55 to 2.7 (2.26) wide. Tegument aspinose. Oral sucker subterminal 0.45 to 0.825 (0.62) long by 0.5 to 0.6 (0.566) wide. Pharynx 0.35 to 0.70 (0.53) long by 0.625 (0.57) wide. Acetabulum 0.73 to 0.78 (0.755) long by 0.70 to 0.95 (0.825) wide. Ratio of oral sucker width to acetabular width 1:1.3 to 1.46. Esophagus 0.38 to 0.55 (0.436) long. Ceca extending to near posterior end.

Testes intercecal, 0.38 to 0.725 (0.576) from posterior tip of body; tandem to obliquely tandem, slightly lobed. Anterior test is 0.25 to 0.375 (0.30) long by 0.40 to 0.625 (0.523) wide; posterior testis 0.275 to 0.375 (0.358) long by 0.45 to 0.55 (0.358) wide. Cirrus sac on left side of acetabulum, extending to about the posterior level of the acetabulum 0.55 to 0.925 (0.90) long by 0.175 to 0.375 (0.308) wide at its dilated end, containing the internal seminal vesicle and reversible cirrus.

Ovary pretesticular, spherical, clearly seen in one specimen, 0.225 to 0.325 (0.266) long by 0.30 to 0.35 (0.316) wide. Mehli's gland immediately postovarian; Laurer's canal? Uterus partly extracecal occupying available space between acetabulum and anterior testis. At level of the posterior border of acetabulum lying close to the left side, the terminal portion of the uterus runs

parallel to the cirrus pouch to open at the common genital pore, which in two specimens protrude to the right, posterior to the intestinal bifurcation. Vagina 0.50 to 1.125 (0.833) long. Vitellaria extracecal, tubular with irregularly spaced tubules; extending from the midbody to the level of the anterior testis, at which level, the glands on both sides meet medially posterior to ovary. Eggs in utero with eyespots 100 to 125 (115) long by 38 to 75 (58) wide microns. Excretory pore posteroterminal; excretory bladder opening to the exterior by the median excretory pore.

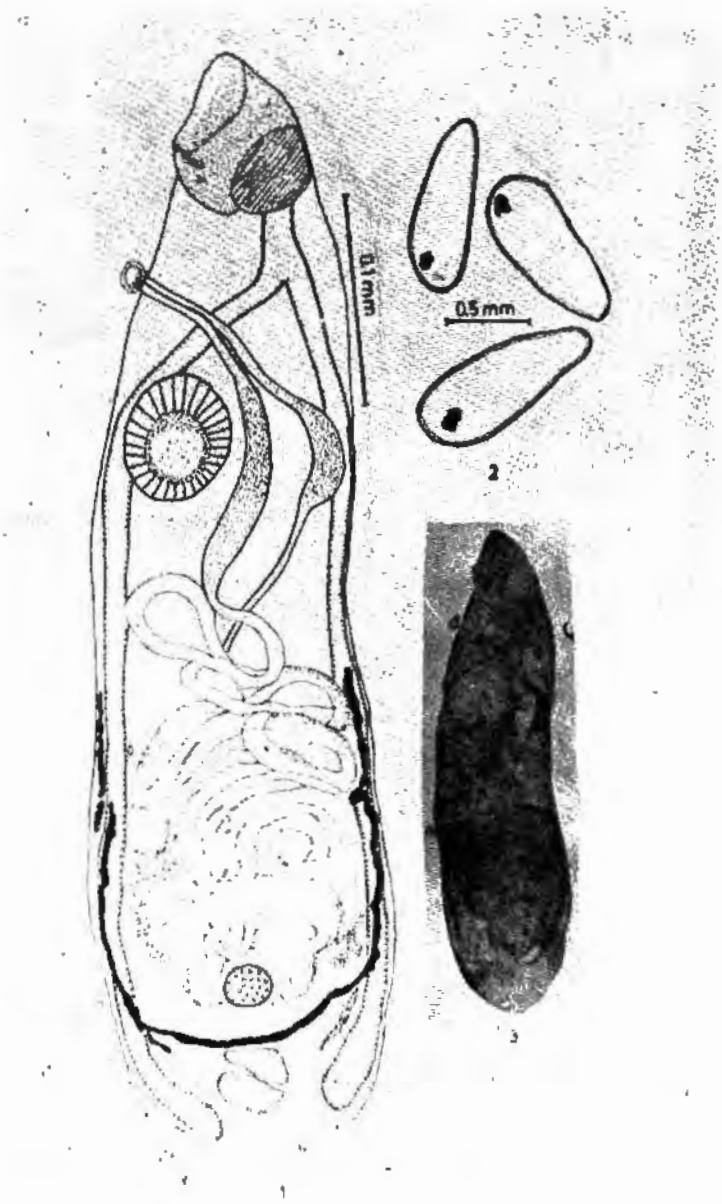
Host: Man
Location: Conjunctiva
Locality: Ilocos Norte, Philippines
Deposited in the C.C.V. Helminthological Collection

Discussion

The genus *Philopthalmus* Looss, 1899 was created for flukes infesting the eyes of birds. Several species have been recorded from the eyes of avian hosts in different parts of the world. Table 1 shows those reported in Asia and Southeast Asia. Tubangui's check list (1947) includes *Philopthalmus problematicus* Tubangui, 1932 from a domestic chicken in Manila and *Philopthalmus rizalensis* Tubangui, 1932 in a domestic duck from Pateros, Rizal. Both species were recovered from the conjunctival sac of the birds.

Philopthalmus III is bigger than the single specimen of *P. problematicus* in Manila from a Rhode Island Red hen imported from the United States and from *P. rizalensis* in the domestic duck from Pateros, Rizal. It is closer to *P. problematicus* in length and position of the cirrus sac but difers in shape and size of the testes; the eggs are bigger about the same size as those from the domestic duck *P. rizalensis* from Pateros, Rizal and *P. anatinus* from Formosa. It falls within the size range of *P. gralli* in the domestic chicken from Tonkin (Mathis and Leger, 1910) and Formosa (Sugimoto, 1928), *P. anatinus* Sugimoto, 1928 from the domestic duck, in Formosa, *P. mirzai* Jaiswal and Singh, 1954 from the common Kite, *Milvus govinda* and *P. indicus* Jaiswal and Singh, 1954 from the Smaller White Scavenger Vulture, *Neophron porenopterus gingianus* in India. The most distinguishing features of *Philopthalmus* III from the human eye are the length and position of the cirrus sac, the shape and position of the testes and size of eggs which is smaller than *P. gralli* from Tonkin and bigger than *P. gralli* from Formosa and *P. mirzai* and *P. indicus* from India.

Included in Table 1 are two philopthalmids reported from the human conjunctiva, that of *P. lacrymosus* (Braun, 1897) by Markovic (1939) in Belgrade and *Philopthalmus* sp. in Ceylon (Dis-



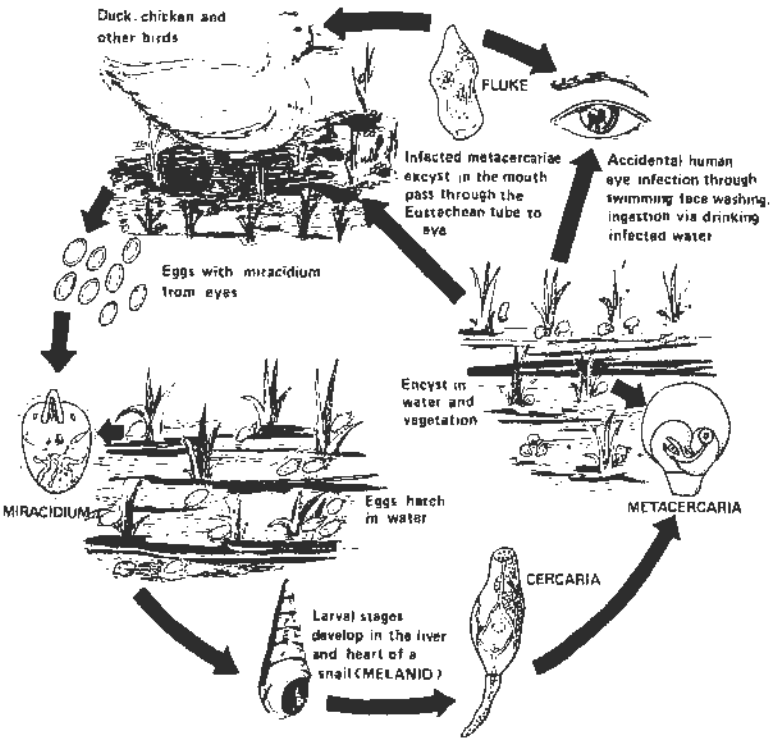
Figures 1,2,3.

sanaike, 1958). *P. lacrymosus* was found earlier in a gull (*Larus maculipennis*) in Brazil and later found by Markovic and Garzicic (1939) in a gull in Belgrade. They believed the infection to be direct to the conjunctiva while the patient bathed in the Sava River. The philopthalmid from a patient in Ceylon was from an Indian resident. He had a history of visiting his home country and bathed in a stream frequented by ducks and crows in Tinnevely, South India (Dissanaike, 1958). The Belgrade infection caused follicular conjunctivitis whereas the Ceylon fluke caused irritation and tenderness of the eyes. In both cases the lesions disappeared after the removal of the worms. At the time, the developmental cycle of any philopthalmid was unknown, hence there was no definite conclusion regarding the mode of entry of the parasite. Dissannaike (1958) conjectured that an "already adult fluke may have fallen off the eye of a bird and invaded the eye of the patient while he was bathing or more probably, the infection took place through the cercaria stage either directly or via the bloodstream". However, he was of the opinion that the cercaria has directly entered the conjunctiva and developed to maturity there.

Philopthalmus III from the human eye in the Philippines can be distinguished from those previously described in human from Belgrade and Ceylon by its bigger size, position of the gonads and genital aperture, shorter cirrus than *P. lacrymosus* and longer than *P.* sp. from Ceylon. The eggs with eyespots are bigger than the two philopthalmids from the human eye.

Philopthalmus III cannot be identified with any of the philopthalmids in Table I. The writer is not inclined in erecting a new taxon until more specimens from avian hosts are available for study.

The family Philopthalmidae Travassos, 1921 are digenetic trematodes and require a snail as intermediate host. They are ovoviviparous since the eggs contain a well formed miracidium. The developmental pattern of *P. gralli* as elucidated by West (1961) in Indiana in the United States and later Cable and Hayes (1963) designated it to be *P. megalurus* (Cert, 1914) and that of *P. gralli* by Alicata (1962) in Hawaii, the eggs hatch in the water and the miracidia actively bore into the tissues of a suitable snail where the larval stages develop. The cercaria are released in the water and encyst as metacercariae on the surface of vegetation or other objects. The encysted flukes are infective to the final host. In Hawaii, the flukes utilized melanid snails, *Stenomelania newcombi* and *Thiara granifera* as intermediate hosts. Experimentally *P. gralli* has been found to develop in the eyes of rats and rabbits (Alicata and Ching, 1960).



Life Cycle of a Philopthalmid
Figure 4.

From the above, the philopthalmid infection from the human eye in the Philippines might have taken place through the cercarial or metacercarial stage directly by washing the face with contaminated water or bathing in contaminated waters frequented by birds (Fig. 4).

Acknowledgement

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ACCIDENTAL HUMAN PHILOPTHALMIASIS IN THE PHILIPPINES

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Ocular parasitic infestation has been reported here and elsewhere. It is quite rare in comparison with ocular infection by bacteria, virus, and fungus, Schistosomiasis is quite frequent and it is a public health problem in the Philippines. In the case reported the route of infestation seems to be direct from the outside. The ocular manifestations of the case seems to be a combination of bacterial infection superimposed on fluke infestation. Could there be some toxin secreted and or excreted by the flukes? Mechanical factors must have played in the pathogenesis of the ocular lesion.

Ophthalmomiasis has been reported many times. What is of fundamental interest in its manifestation is the feeding by the worms on the necrotic tissue but not on the live tissues. In any infected-infested corneal ulcer there are areas which are necrotic, infected, toxin affected and normal tissue. What is of fundamental interest here is how the maggots can recognize the dead and the necrotic tissue upon which they fold. As a matter of fact the problem of determining whether a cell or intercellular tissue (fibers and membranes) is dead or alive is a basic question which we have investigated for many years by numerous experiments. These form the background of our concept that the most essential property of living cells and non-cellular membranes and fibers is biological self renewal or in simple terms, biological "turn over". This is the most significant property of living things. Dead structures cease to undergo self-renewal. How the maggots can differentiate the necrotic from the living tissue challenges imagination and investigation.

Dr. Edito G. Garcia, M.D., Discussant

The data presented and reviewed by Dr. Velasquez indicate that trematodes of the Family Philopthalmidae and particularly of the Genus *Philopthalmus* are enzootic in portions of the Philippines like areas around Laguna de Bay Lake. These flukes are commonly called "eye flukes" of birds although some species also inhabit avian intestines.

Although the case presented is only the 3rd reported in humans, it is possible that more cases actually occur. The potential for exposure or contact with philopthalmid cercariae or metacercariae may actually be significant among duck raisers, fishermen and children at leisure in endemic areas. Consequently it is suggested that further studies be done. These should include:

1. identification of endemic areas
2. determination of prevalence in ducks and possible economic loss resulting from infections
3. determination of frequency of philopthalmiasis among duck raisers, fishermen and other potentially exposed segment of the human population in endemic areas.

This will lead to indicators for determining if this group of trematodes is a problem of health needing more attention.