

CHAP. III - EMBRANCHEMENT DES MYXOZOA

III.1.- Caractères généraux

Les Myxozoaires sont pour la plupart des parasites de poissons. Ils sont caractérisés par des **spores multicellulaires** à une ou plusieurs valves. Les spores se développent à l'intérieur de **pansporoblastes** ou **plasmodes** multinucléés.

III.2.- Cycle de *Myxobolus cerebralis*.

M. cerebralis parasite le cartilage des poissons de la famille des salmonidae (Truites, Saumon) chez lesquels il cause une sorte de tournis.

Les spores seraient absorbées par la jeune truite. Au niveau de son intestin, les valves de la spore s'ouvrent [1] et libèrent le sporoplasme à 2 noyaux haploïdes [2] dont la fusion (autogamie) donne un germe amiboïde diploïde appelé **sporoplasme** ou **amibule** [3]. L'amibule traverse la paroi intestinale et pénètre divers organes. Dans le cartilage de la tête, le parasite s'accroît (jusqu'à 1mm, 4 mois après l'infection) en subissant des divisions nucléaires sans cloisonnement par des membranes plasmiques. L'individu ainsi formé est un plasmode (ou pansporoblaste) [4-8]. Le cytoplasme qui entoure certains noyaux du pansporoblaste constitue avec ceux-ci un **énergide**. Chaque énergide se transforme en **spore** [10 & 11] environ 8 mois après l'infection. Les spores demeurent généralement dans les lésions jusqu'à la rupture de celles-ci ou à la mort du poisson.

L'hypothèse d'un stade de développement chez les annélides oligochètes a été évoquée.

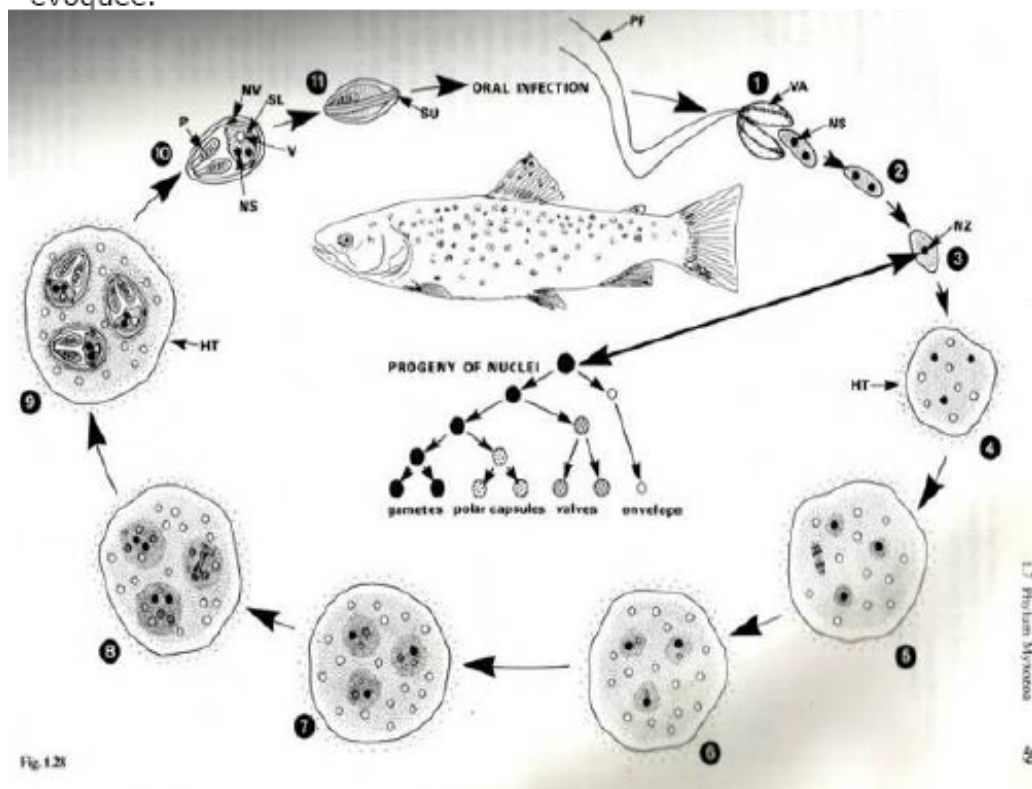


Fig.1.28. Life cycle of *Myxosoma (Myxobolus) cerebralis*, which parasitizes the cartilage of salmonids, causing the *whirling disease*. 1-3 Upon reaching the intestinal tract of young trout the valves of the spores ($7-9 \times 7-10 \mu\text{m}$) open and release the sporoplasm with its two haploid nuclei, which start fusing if they have not already done so. The zygotic sporoplasm (amoebula) enters the intestinal wall and is carried via the circulatory system to various organs. After penetration into the cartilage (mainly of the head and posterior part of the spine) further development is initiated. 4-9 The young parasites grow and form a plasmodium; nuclear divisions start and they reach a diameter of up to 1 mm (about 4 months after infection). Inside this plasmodium some cytoplasm becomes segregated around each generative (*black*) nucleus to form a separate cell within the plasmodium. These cells will eventually produce the spores and are thus called sporoblasts; in *M.cerebralis* two cells unite (6), one enveloping the inner one (sporogonic cell), thus giving rise to a pansporoblast (=spore producer). The pericyte remains a mere envelope, while the sporogonic cell divides to produce the cells to form two sporoblasts (i.e. valvogenic, capsulogenic or

sporoplasmic cells). The nuclear fate is shown in the center. During sporoblast formation, its cells are supposed to undergo a one-step-mitosis to become haploid. The originally single nucleus of the sporoplasm divides once more and gives rise to two haploid nuclei, which are thus considered as gametes fusing in autogamy (3). After divisions nuclei appear in groups and initiate formation of spores which is completed about 8 months after infection (9). 10, 11 The mature spores, which are shown in ventral (10) and lateral view (11), generally remain in the lesions and can be found in fish of up to 3 years of age. The spores may escape from the host by several means (death of fish, rupture of lesions, etc.). Recent findings by Wolf and Markiw (see Lom 1987) indicated that *M. cerebralis* may have developmental stages in oligochaetes there appearing as *Triactinomyxon* sp.- an organism belonging to another class of the Myxozoa, thus indicating a two-hosts-life-cycle. HT, host tissues surrounding the parasitic plasmodium; NS, nuclei of SL (haploid, gametes); NV, nucleus of valve; NZ, nucleus of zygote (diploid); P, polar capsule with polar filament; PF, polar filament; S, suture of valve; SL, sporoplasm; V, vacuole; VA, valve

HT=tissus de l'hôte entourant le plasmode, NS=noyau d'un gamête (SL), NV=noyau de la valve, NZ noyau diploïde du zygote, P=capsule polaire, PF=filament polaire, SL=sporoplasme, SU=suture de la valve, V=vacuole, VA=valve.