THE ASSIGNMENT OF *HEPATOZOOM MAURITANICUM*, A TICK-TRANSMITTED PARASITE OF TORTOISE, TO THE GENUS *HEMOLIVIA*

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Summary :

Following a new examination of material from E. Brumpt's collection with stages of *Hepatozoon mauritanicum*, a Hemogregarin from the north african tortoise *Testudo graeca*, in the vector, *Hyalomma aegyptium*, the taxonomic status of the parasite was revised and the latter was assigned to the genus *Hemolivia*.

KEY WORDS : *Hepatozoon mauritanicum*, *Hemolivia mauritanica*, taxonomic status.

Résumé :

CLASSEMENT DANS LE GENRE *HEMOLIVIA* D'*HEPATOZOOM MAURITANICUM*, PARASITE DE TORTUES TRANSMIS PAR DES TIQUES

À la suite d'un nouvel examen des lames de la collection E. Brumpt avec des stades de développement, dans la tique *Hyalomma aegyptium*, d'*Hepatozoon mauritanicum* l'hémogrégarine de la tortue nord-africaine *Testudo graeca*, le statut taxonomique du parasite est révisé et celui-ci est placé dans le genre *Hemolivia*.

MOTS CLÉS : *Hepatozoon mauritanicum*, *Hemolivia mauritanica*, statut taxonomique.

Histological sections of infected *Hyalomma aegyptium* ticks from E. Brumpt collection in the Muséum National d'Histoire Naturelle in Paris, which were used for the redescription by Michel (1973) of *Hepatozoon mauritanicum* of the tortoise *Testudo graeca* were reexamined. The species had first been studied by Brumpt, 1938 under the name of *Haemogregarina mauritanica* Sergent & Sergent, 1904. Stages redescribed by Michel were reinterpreted in the light of recent descriptions of species assigned to the genus, *Hemolivia* :

— *Hemolivia stellata*, a toad (*Bufo marinus*) hemogregarinid developing in the gut of the tick *Amblyomma rotundatum* (Petit *et al.*, 1990);

— *Hemolivia mariae* from the sleepy lizard (*Tiliqua rugosa*) and the tick *A. limbatum* (see Smalldridge & Paperna, same issue).

The genus *Hemolivia* is characterized by a double cycle in the intestinal cells of the vector: oocysts which produce, when mature, large numbers of sporokinets

which become free and invade new cells of the intestine of the tick; a second division occurs with production of sporocysts filled with sporozoites. The two species mentioned above had in addition very characteristic star shaped oocysts.

In the material of E. Brumpt we observed in the intestinal cells, oocysts, sporokinets and sporocysts containing sporozoites, characteristic of the genus *Hemolivia*. However, although the oocysts were irregular in outline, no definite stellate shape, as seen in other species of *Hemolivia*, was observed.

In the blood of the tortoise, as in the toad, in addition to gametocytes, shizonts and cysts with one cystozoite, were also observed.

It appears that haemogregarines developing in ticks differ distinctly, from those of the genus *Hepatozoon*, developing in dipteran insect hosts. Such divergence has also been suggested from a phylogenetic analysis done by Smith & Desser (in press) showing closer phyletic proximity between *Hep. lygosomorum*, a skink and mite species and *Hep. mauritanicum*, than with the rest of the haemogregarines.

TAXONOMIC STATUS

Haemolivia mauritanica (Sergent & Sergent, 1904) n. comb.

Syn. *Haemogregarina mauritanica* (Sergent & Sergent, 1904), *Hepatozoon mauritanicum* (Sergent & Sergent, 1904), Michel, 1973.

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Fig. 1-7 — Sporogony of *Hemolivia mauritanica* in the intestinal cells of the tick *Hyalomma aegyptium*.

1: young oocysts and sporokinets (arrow); 2, 3: immature oocysts with cytoplasmic protrusions at the periphery; 4: immature oocyst with peripheral arrangement of nuclei and numerous cristalloid bodies; 5, 6: maturing oocysts with numerous sporokinets; 7: mature oocyst with sporokinets (left) and sporocyst (arrow).

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REFERENCES

- BRUMPT E. Formes évolutives d'*Haemogregarina mauritana* chez la tique *Hyalomma syriacum*. *Annales de Parasitologie humaine et comparée*, 1938, 16, 350-361.
- MICHEL J.C. *Hepatozoon mauritanicum* (Sergent & Sergent, 1904) n. comb. parasite de *Testudo graeca* : redescription de la sporogonie chez *Hyalomma aegyptium* et de la schizogonie tissulaire d'après le matériel d'E. Brumpt. *Annales de Parasitologie humaine et comparée*, 1973, 48, 11-21.
- PETTIT G., LANDAU I., BACCAM D. & LAINSON R. Description et cycle biologique d'*Hemolivia stellata* n. g., n. sp., Hémo-grégarine de crapauds brésiliens. *Annales de Parasitologie humaine et comparée*, 1990, 65, 3-15.
- SMALLRIDGE C. & PAPERNA I. The tick transmitted haemogregarinid of the Australian sleepy lizard *Tiliqua rugosa* belongs to the genus *Hemolivia*. *Parasite*, 1997, 4, 359-363.
- SMITH T.G. & DESSER S.S. Phylogenetic analysis of the genus *Hepatozoon* Miller, 1908 (Apicomplexa: Adeleorina). *Systematic Parasitology*, 1997, in press.

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