FUNCTIONAL ROLES AND ECOLOGICAL PERSPECTIVE IN NEMATODES PARASITE OF SMALL MARSUPIALS

ELISEU BALDEZ DO NASCIMENTO NETO[1], NAYARA YOSHIE SANO[2, 3], BEATRIZ ELISE DE ANDRADE SILVA[1, 2], EDUARDO JOSÉ LOPES TORRES[1, 2]

[1]LABORATÓRIO DE HELMINTOLOGIA ROMERO LASCASAS PORTO, DEPARTAMENTO DE MICROBIOLOGIA, IMUNOLOGIA E PARASITOLOGIA,
UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO – UERJ, RJ, BRAZIL.
[2]PROGRAMA DE PÓS-GRADUAÇÃO EM MICROBIOLOGIA, IMUNOLOGIA E PARASITOLOGIA DA
UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO – UERJ, RJ, BRAZIL.
[3]PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS AMBIENTAIS E SUSTENTABILIDADE AGROPECUÁRIA DA UNIVERSIDADE CATÓLICA DOM BOSCO – UCDB, MS, BRAZIL.

Host-parasite interactions shape ecosystems, affecting host physiology, behavior, and ecology. This study analyzed helminth community structure and function using ecological networks and the core-satellite concept. Data were collected in 2014, 2022, and 2023 in Pantanal, Mato Grosso do Sul. Helminths were identified morphologically and molecularly. Interactions were assessed via network analysis, with species classified by Zi (within-module degree) and Pi (participation coefficient) (Guimerà & Amaral, 2005). Abundance categories followed Holmes & Price (1986): core (>2), secondary (0.6–2), satellite (0.2–0.6), and rare (<0.2). Ultra-peripheral species (Pi=0) included *Pterygodermatites* sp., *Spirura guianensis*, *Spirura mexicana*, and hosts *Marmosops ocellatus* and *Marmosa (Micoureus) budini*. Peripheral species, such as *Spirura* sp., *Gracilioxyuris agilisis* and *Pterygodermatites jagerskioldi* interacted mainly within modules (0.05<Pi≤0.62). Non-hub connectors including *Didelphoxyuris thylamisis* and the host *Gracilinanus agilis* linked multiple modules (0.62<Pi≤0.80). Hosts *Thylamys macrurus* and *Gracilinanus agilis* had high Zi values (15.0), indicating potential hubs. Core species included *Didelphoxyuris thylamisis* and *Gracilioxyuris agilisis* (>2), secondary *Physaloptera herthameyrae* (0.6–2), satellite *Pterygodermatites hymanae* (0.2–0.6), and rare *Subulura eliseae*, *Spirura guianensis*, *Spirura* sp., *Pterygodermatites jagerskioldi*, *Pterygodermatites* sp., *Spirura mexicana* (<0.2). This study integrates network analysis with core-satellite theory, highlighting key species in marsupial-helminth communities. *Didelphoxyuris thylamisis* and *Gracilioxyuris agilisis* were monoxenous; others were heteroxenous. Further analyses revealed that monoxenous and heteroxenous helminths differ in prevalence, which influences functional connectivity in the network (Pi). These suggest that helminths with distinct life cycles contribute differently to the ecological structure of the parasitic network.

Supported By: FAPERJ-JCNE, CNPq-Universal, UERJ, FINEP.
Keywords: MARSUPIALS, NEMATODE, NETWORK