

An Integrated Morphological and Molecular Approach for Detection of Enteric Parasites in Captive Reptiles



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Background

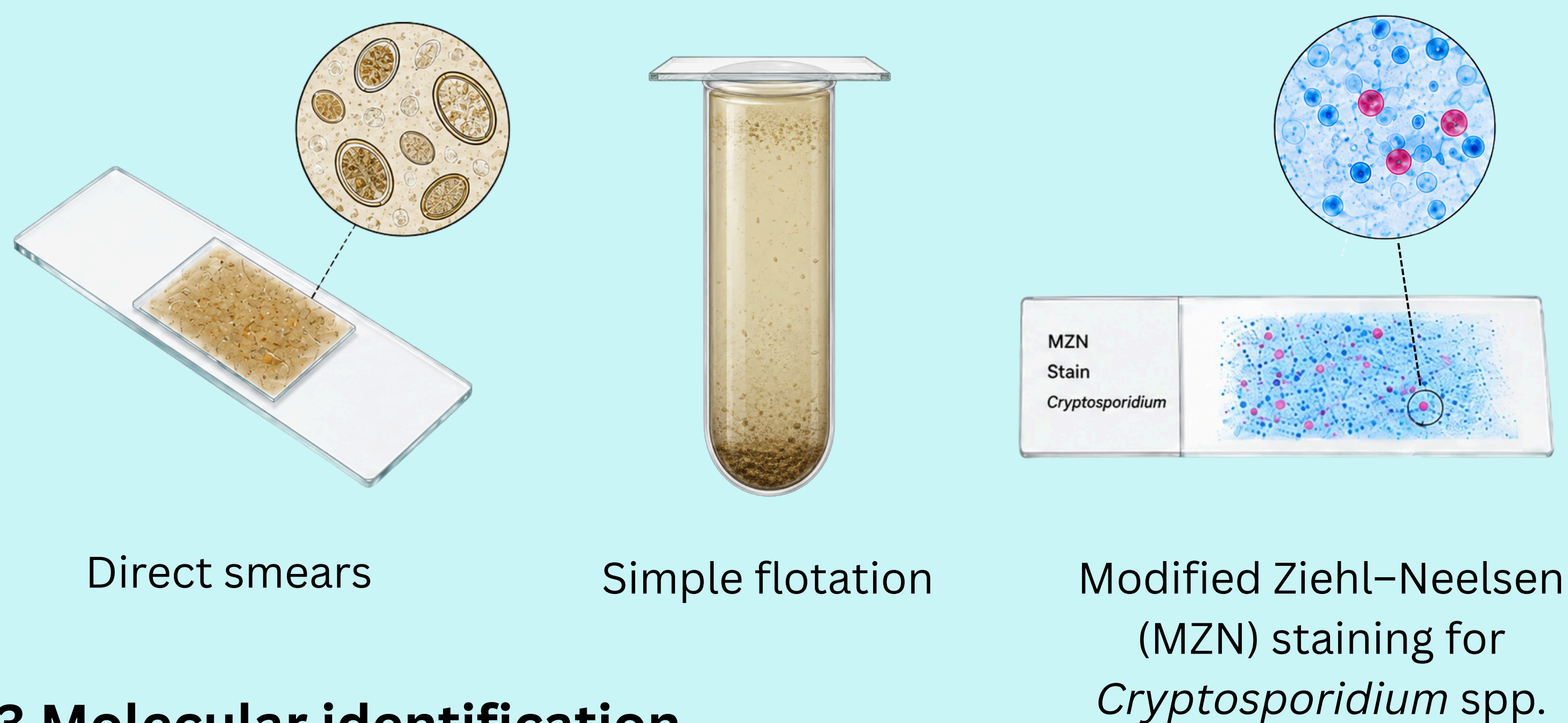
The rising popularity of exotic pet cafés and animal markets has created high-density, mixed-species environments for captive reptiles. These settings can act as epidemiological hotspots for gastrointestinal parasites, increasing the risk of cross-contamination and impacting animal welfare. Due to limited baseline surveillance in these settings, a targeted pilot study is necessary to determine the diversity of existing endoparasites.

Methods

1 Sample collection (January - February 2026.)

- 12 fecal samples (10 tortoises and 2 iguanas)

2 Morphological screening



3 Molecular identification

- Polymerase chain reaction (PCR)
 - Nematodes : NEM18F/R primers
 - Protozoa : EukA/B primers
 - *Cryptosporidium* : SSU2F/R & SSU3F/R (nested PCR)
- Sequencing: BLAST against the NCBI database

Results and Discussion

Microscopic examination

- Gastrointestinal nematode eggs (3/12)
- *Nyctotherus*-like organisms (7/12)
- Coccidian oocysts (4/12)
- *Cryptosporidium* spp. were not detected.

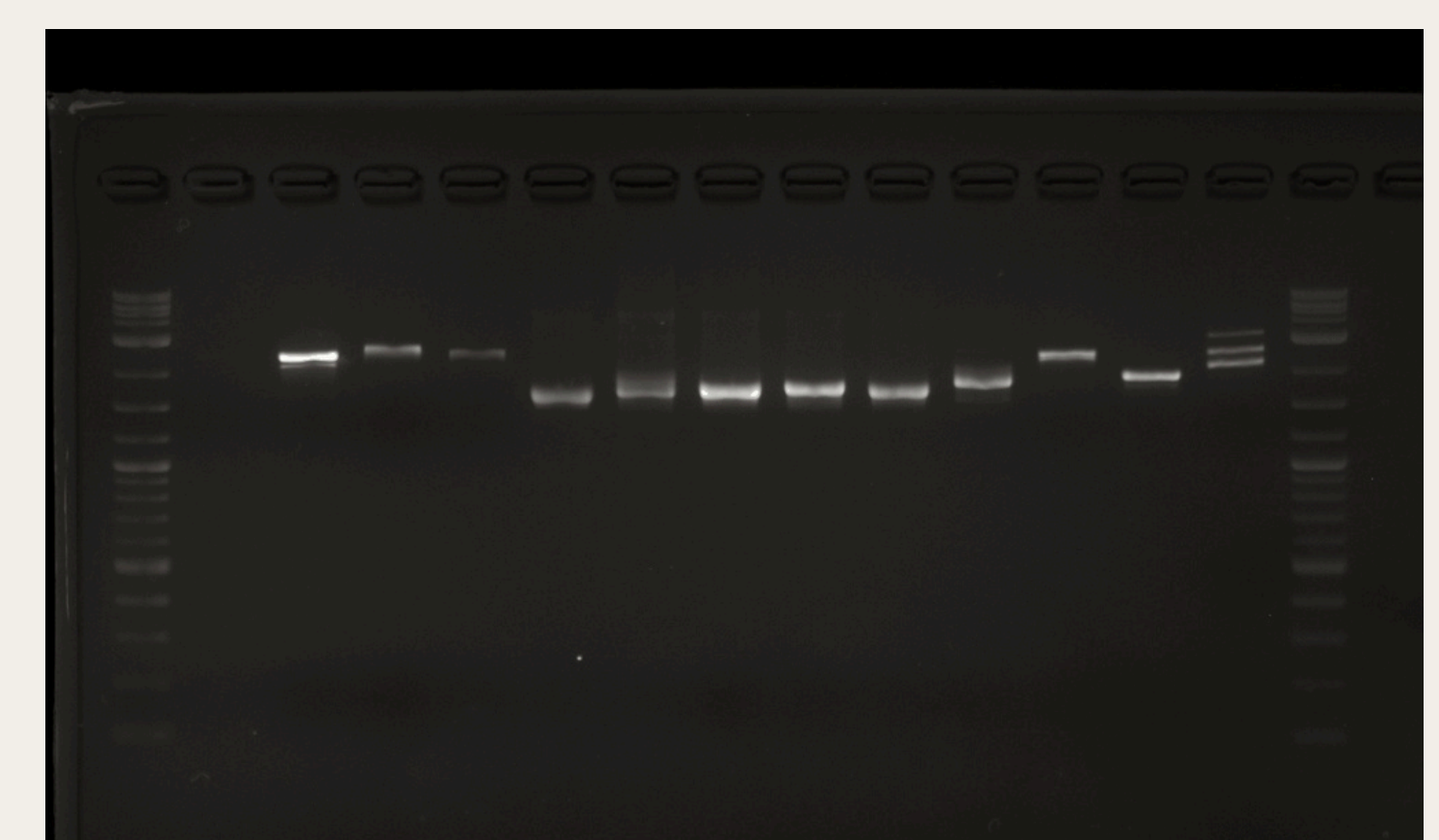
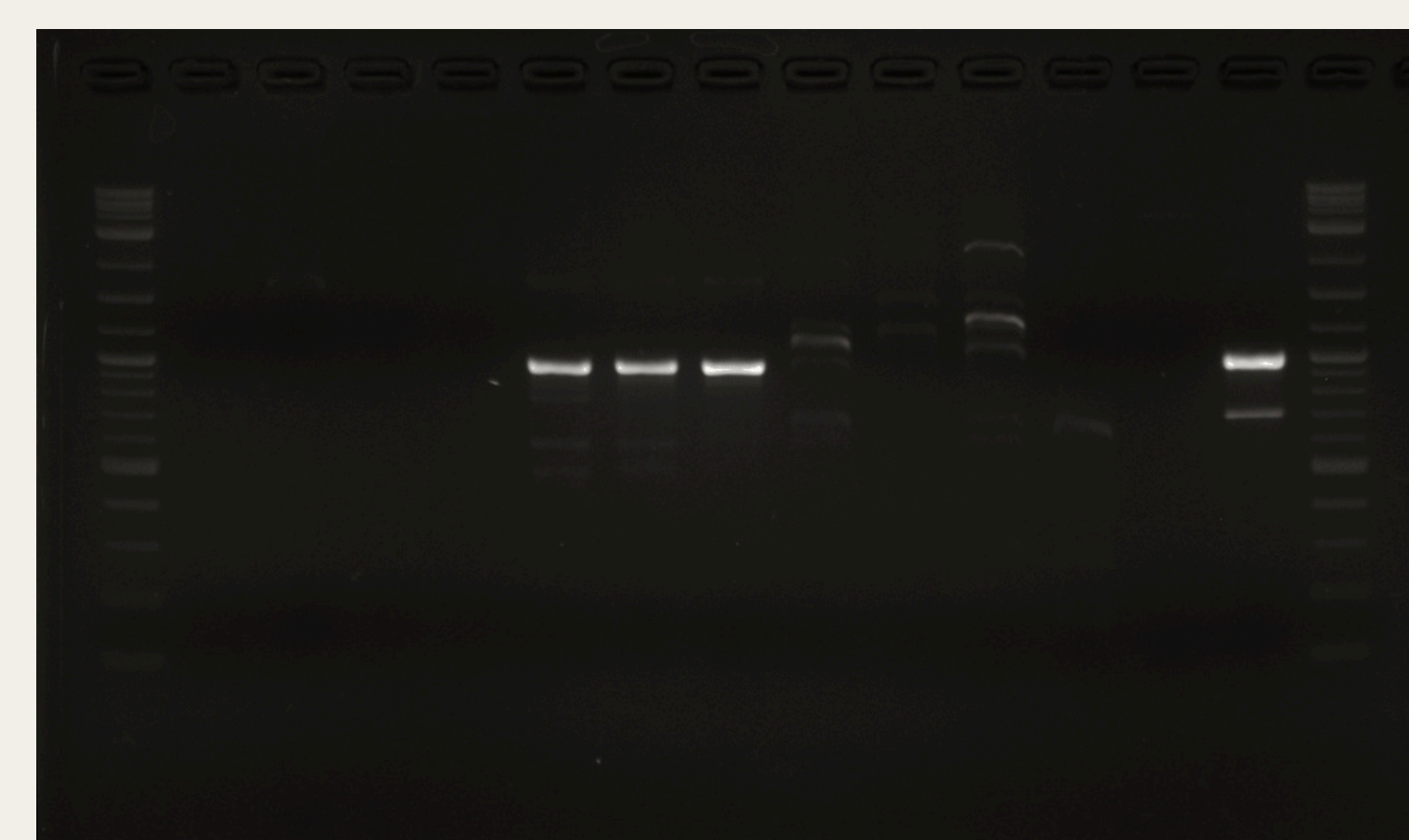


Molecular and sequencing findings

- NEM18S F/R primers detected nematodes in 7 samples
 - 2 samples yielded identifiable sequences
 - *Thelandros tinerfensis* (97.50% identity)
 - *Ozolaimus linstowi* (99.41% identity)
- EukA/B primers detected protozoa in 12 samples
 - 4 samples were successfully identified
 - *Nyctotherus ovalis* (92% identity)
 - *Nyctotheroides* spp. (99.12%, 98.35%, and 92.08% identity)
- No amplification of *Cryptosporidium*

NEM18S F/R Primer

EukA/B Primer



Discussion

The molecular results were in general agreement with the microscopic findings, particularly for ciliate protozoa. However, PCR detected more positive samples than microscopy. This likely reflects its higher sensitivity, especially in samples with low parasite levels that may be difficult to detect under the microscope. The identified organisms are fundamentally non-pathogenic, functioning as benign commensals, transient pseudoparasites, or essential digestive mutualists within the reptile gastrointestinal tract

Conclusion

This study demonstrates that an integrated morphological-molecular approach enhances the detection and identification of gastrointestinal parasites in captive reptiles. While microscopic examination identified broad parasite groups, molecular analysis enabled species-level identification and detected a greater number of positive samples. These findings contribute to improving diagnostic approaches for parasite surveillance in captive environments.

Acknowledgement

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References

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