

Occurrence of *Anisakis sp.* Infection in Indian Mackerel (*Rastrelliger sp.*) from Traditional Markets in Bogor, Indonesia: Morphological and Molecular Confirmation

Tetty Barunawati Siagian¹, Risa Tiuria², Gary Yefta Herbeth Siagian³, Dhito Dwi Pramardika⁴

¹College of Vocational Studies, IPB University, Bogor, 16128, Bogor, Indonesia

²School of Veterinary Medicine and Biomedical Sciences, IPB University, Dramaga Bogor, 16680, Bogor, Indonesia

³Food Technology Study Program of Faculty of Science and Technology, University Terbuka, Jakarta, 15418, Jakarta,

⁴Department of Health, Politeknik Negeri Nusa Utara, 95812, North Sulawesi, Indonesia

BACKGROUND

- Indian mackerel (*Rastrelliger sp.*) is widely consumed in Indonesia.
- Marine fish may act as intermediate hosts of zoonotic *Anisakis spp.*
- Human infection occurs through raw or undercooked fish consumption.
- Data on retail mackerel infection in Bogor remain limited.

OBJECTIVE

To determine the prevalence, infection intensity, morphological characteristics, and molecular identity of *Anisakis* larvae in retail Indian mackerel in Bogor.

METHODS

Sampling (n=35; 7 markets; May-June 2024)

Necropsy & Intestinal Examination

Morphological Identification (L3 type I)

PCR Amplification (ITS rDNA)

BLAST & Phylogenetic Analysis

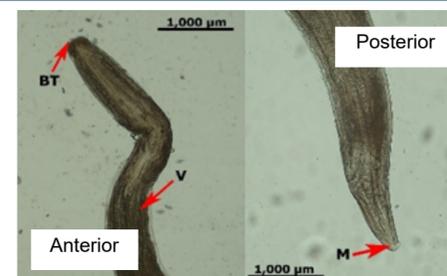


Original image (This study)

MORPHOLOGICAL IDENTIFICATION



MACROSCOPIC
Cylindrical white L3 larvae



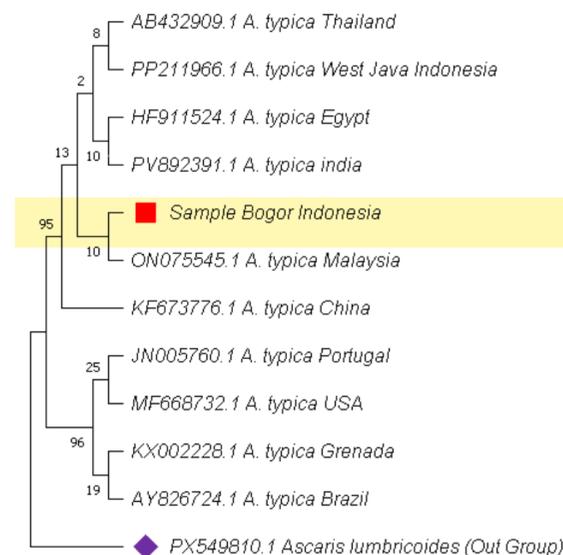
MICROSCOPIC
BT: Boring tooth present
V: Prominent ventriculus
M: Mucron at posterior

- Consistent with *Anisakis* type I larvae

MOLECULAR CONFIRMATION

MOLECULAR RESULTS

- ITS rDNA (~969 bp) successfully amplified
- BLAST showed ~100% identity with *Anisakis typica*
- No higher similarity with other Anisakidae species



PHYLOGENETIC ANALYSIS

- Bogor isolate clustered within *Anisakis typica* clade
- Strong bootstrap support (95%)
- Closely related to Asian isolates
- Clearly separated from *Ascaris lumbricoides* (outgroup)

PCR-confirmed as *Anisakis typica*

CONCLUSION

Moderate prevalence (45.7%) of zoonotic *Anisakis typica* was detected in retail Indian mackerel in Bogor. Molecular analysis confirmed species identity and close relation to Asian isolates. Infection intensity was significantly higher in smaller fish (Spearman $r = -0.66$; $p < 0.001$). These findings indicate a potential public health concern.

REFERENCES

The authors declare no conflicts of interest.
Selected References:
Mostafa et al., 2023 – Molecular identification of *A. typica*
Martin-Carrillo et al., 2022 – *Anisakis* in commercial fish
Zeng et al., 2024 – Zoonotic *Anisakis* in retail fish



STUDY AREA

Seven traditional markets in Bogor:

Surya Kencana, Anyer, Cibinong, Ciampea, Bojong Gede, Darmaga, Siliwangi.

EPIDEMIOLOGICAL RESULTS

Overall Prevalence

45.7%

Mean Intensity

10.2 parasites /fish

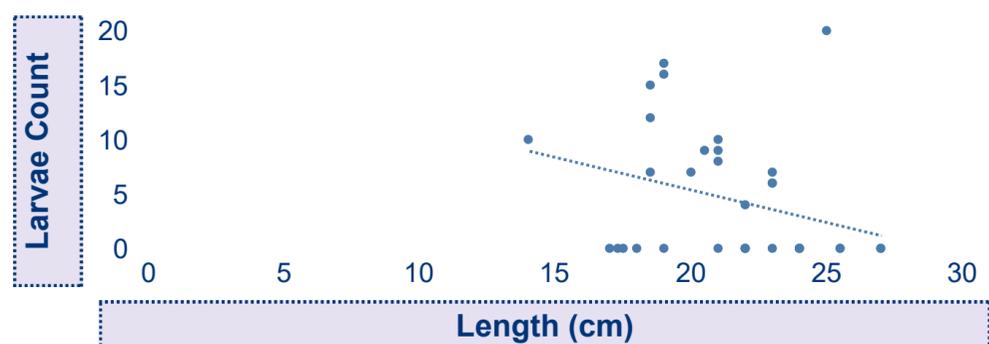
Highest Prevalence

100% at Bojong Gede

GRAPH PREVALENCE



- Infection intensity was significantly higher in smaller fish.



Spearman $r = -0.66$; $p < 0.001$ (n = 35)
A significant negative correlation was observed.