A process for differentiating species of Plasmodium

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Technology ID:
ICMR/EoI/PM/13/Plasmodium sp. Differentiator/2026

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Institute: ICMR – National Institute of Malaria Research, Delhi

Technology Domain: Diagnostics

Disease Area (Broad):

Communicable Diseases (bacterial, viral, fungal, parasitic) – Vector Borne Disease.

Need and utility of the Technology from Public health perspective:

The PCR-RFLP mitochondrial assay offers a highly sensitive, cost-effective alternative to microscopy and RDTs, detecting as few as 0.5 parasites/µL. It identifies all four major Plasmodium species through a single-step PCR and a rapid enzymatic digestion. This enables reliable detection of low-density and mixed infections, ensuring timely, species-specific treatment.

Technology Readiness level (TRL):

TRL5: Validated at laboratory and by third-party

Validation Status and outcome:

The technology is validated in WHO-accredited Quality Control Laboratory of NIMR. The turnaround time for the procedures is less with superior sensitivity as compared to gold standard nested PCR.

Market Potential:

The mitochondrial-based PCR-RFLP process has strong market potential as a sensitive, cost-effective solution for accurate differentiation of P. vivax, P. falciparum, P. malariae, and P. ovale. It addresses key gaps in routine diagnostics—particularly for low-density and mixed infections—making it valuable for public health labs, malaria elimination programs, research institutes, and diagnostic manufacturers seeking reliable species-specific detection to support surveillance and treatment accuracy.

Publication:

- Sharma, Supriya et al. "Novel molecular diagnostic technique for detecting the different species of Plasmodium." Infection, genetics and evolution : journal of molecular epidemiology and evolutionary genetics in infectious diseases vol. 78 (2020): 104122.

IP Filing: Indian Patent 426216 (PCT Application: WO2016120886)