

Detection and molecular characteristics of *Meloidogyne graminicola* on rice in Java Indonesia based on ribosomal DNA gene

Mutala'lih Mutala'lih^{1,2}, Siwi Indarti¹, Y. Andi Trisyono¹ Alan Soffan¹

¹Department of Plant Protection, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Indonesia.

²Department of Agrotechnology, Faculty of Agriculture, Universitas Jenderal Soedirman, Banyumas, Indonesia.

DOI: 10.7324/JABB.2026.296032

SUPPLEMENTARY MATERIALS

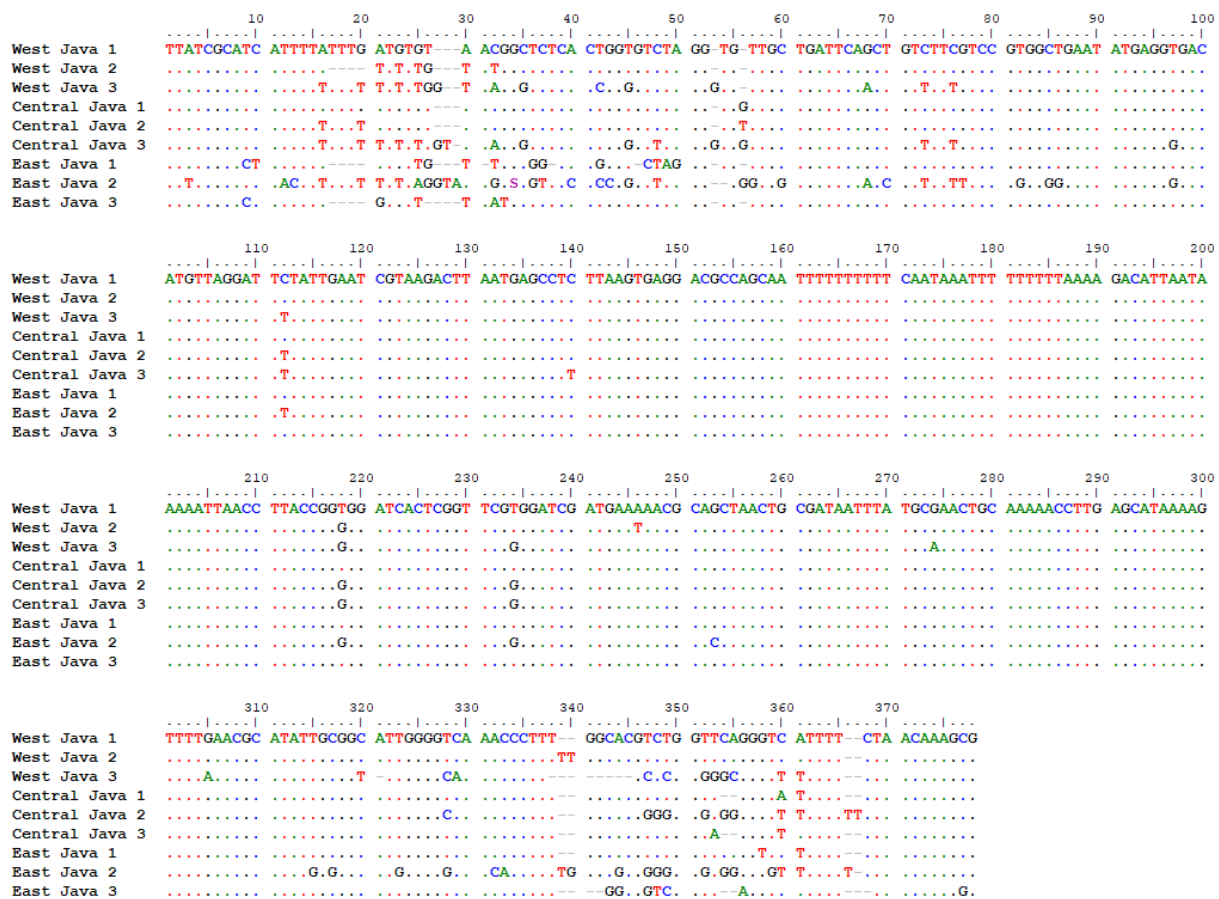


Figure S1: Multiple alignment sequences of *Meloidogyne graminicola* in Java population.

```

      10      20      30      40      50      60      70      80      90     100
West Java 1  TTATCGCATC ATTTTATTTG ATGTGT--A ACGGCTCTCA CTGGTGTCTA GG-TG-TTGC TGATTGAGCT GTCTTCGTCC GTGGCTGAAT ATGAGGTGAC
West Java 2  .....T...T...T.T.TG--T .T.....
West Java 3  .....T...T.T.T.TGG--T .A..G..... .C..G..... .G......A...T..T.....

      110     120     130     140     150     160     170     180     190     200
West Java 1  ATGTTAGGAT TCTATTGAAT CGTAAGACTT AATGAGCCTC TTAAGTGAGG ACGCCAGCAA TTTTTTTTTT CAATAAATTT TTTTAAAAA GACATTAATA
West Java 2  .....T.....
West Java 3  .....T.....

      210     220     230     240     250     260     270     280     290     300
West Java 1  AAAATTAACC TTACCGGTGG ATCACTCGGT TCGTGGATCG ATGAAAAACG CAGCTAACTG CGATAATTTA TCGGAAGTGC AAAAACCTTG AGCATAAAAG
West Java 2  .....G.....T.....
West Java 3  .....G......G......A.....

      310     320     330     340     350     360     370
West Java 1  TTTGAACGC ATATTGCGGC ATTGGGGTCA AACCCTTT--GGCACGTCG GTTCAGGGTC ATTTT--CTA ACAAAGCG
West Java 2  .....TT.....
West Java 3  .....A.....T.....CA.....C.C..GGGC...T T.....

```

Figure S2: Multiple alignment sequences of *Meloidogyne graminicola* in West Java.

```

      10      20      30      40      50      60      70      80      90     100
Central Java 1 TTATCGCATC ATTTTATTTG ATGT--GTAA CCGCTCTCAC TGGTGTCTAG G-TGGTGTCT GATTGAGCTG TCTTCGTCCG TGGCTGAATA TGAGGTGACA
Central Java 2  .....T...T.....T.....
Central Java 3  .....T...T.T.T.TT...A..G......G..T...G......T..T......G.....

      110     120     130     140     150     160     170     180     190     200
Central Java 1 TGTTAGGATT CTATTGAATC GTAAGACTTA ATGAGCCTCT TAAGTGAGGA CGCCAGCAAT TTTTTTTTTC AATAAATTTT TTTTAAAAAG ACATTAATAA
Central Java 2  .....T.....
Central Java 3  .....T.....

      210     220     230     240     250     260     270     280     290     300
Central Java 1  AAATTAACCT TACCGGTGGA TCACTCGGTT CGTGGATCGA TGAAAAACGC AGCTAACTGC GATAATTTAT GCGAACTGCA AAAACCTTGA GCATAAAAGT
Central Java 2  .....G.....
Central Java 3  .....G.....

      310     320     330     340     350     360     370
Central Java 1  TTTGAACGCA TATTGCGGCA TTGGGGTCAA ACCCTTTGGC ACGTCTGGTT GGG---TAT TTTTCTAACA AAGCG
Central Java 2  .....C......GGG..G...GGTT.T.....
Central Java 3  .....A......TA.....

```

Figure S3: Multiple alignment sequences of *Meloidogyne graminicola* in Central Java.

```

      10      20      30      40      50      60      70      80
East Java 1  .....TT ATCGCACTAT TTTAATGTT- GTTGGCGGCA CGGGTCTA-G GGTGTTGCTG ATTCAGCTGT CTTCGTCCGT G
East Java 2  TTTTCGCA.C .A.TTTT.T. ...T.G..AA AGGSCGTT.C .CC.GG.TTA ..G.G..G.. ....A.C.. T..TT...G .
East Java 3  -----.. .....C.. ....G...T AA..CTCT.. .T...G.CTA .....

      110     120     130     140     150     160     170     180
East Java 1  GTTAGGATTC TATTGAATCG TAAGACTTAA TGAGCCTCTT AAGTGAGGAC GCCAGCAATT TTTTTTTCA ATAAATTTT T
East Java 2  .....T .....
East Java 3  .....

      210     220     230     240     250     260     270     280
East Java 1  AATTAACCTT ACCGGTGGAT CACTCGGTTT GTGGATCGAT GAAAAACGCA GCTAACTGCG ATAATTTATG CGAACTGCAA A
East Java 2  .....G..... .G..... C.....
East Java 3  .....

      310     320     330     340     350     360     370
East Java 1  TTGAACGCAT ATTGCGGCAT TGGGGTCAAA CCCTTT--GG CACGTCTGGT TC-AGGTTCT TTTTCTAACA AAGCG
East Java 2  .....G.G..... G...G...C A...TG.. .G..GGG..G .GGG..G.T. ....
East Java 3  .....GTC... ---.CA. ....G.

```

Figure S4: Multiple alignment sequences of *Meloidogyne graminicola* in East Java.