



Plant parasitic nematodes of medicinal plants in Manipur 2: The species of the genus *Scutellonema*

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Abstract

A survey of plant parasitic nematodes associated with medicinal plants carried out in different localities of Imphal West district of Manipur revealed the occurrence of a large number of known tylenchids. In this survey, five known species i.e. *Scutellonema africanum*, *Scutellonema clathricaudatum*, *Scutellonema commune*, *Scutellonema imphalus* and *Scutellonema sheri* were recorded.

Keywords: medicinal plants, tylenchids, species, *scutellonema*

Introduction

A survey of plant parasitic nematodes associated with medicinal plants carried out in different localities of Manipur revealed the occurrence of a large number of plant parasitic nematodes. In the survey, five known species belonging to the genus *Scutellonema* i.e. *S. africanum* Smith, 1971^[6], *S. clathricaudatum*, Whitehead, 1959^[9], *S. commune* Van Der Berg & Heyns, 1973^[8], *S. imphalus* Sultan & Jairajpuri, 1979^[7] and *S. sheri* Edward and Rai, 1970^[5] were recorded from different medicinal plants of Manipur. Different researchers also reported about different plant parasitic nematode in different countries, D.L. Coyne *et al.* (2018)^[2], D.L. Coyne *et al.* (2014)^[3], D.J. Hooper *et al.* (2005)^[4], but such works specially in Manipur can help the new researchers in their taxonomical studies.

Materials and Methods

Soil samples were collected from different localities of Manipur. The collected soil samples were processed for extraction of nematodes by Cobb's (1918) modified sieving and decantation techniques followed by Baermann's funnel technique. The specimens were killed and fixed by hot 4% formalin and mounted in anhydrous glycerine.

Results and Dimensions

Scutellonema africanum Smith, 1971^[6]

Females (4): L= 0.67 – 0.73 (7.0) mm; a = 21.5 -23.5 (22.0); b = 5.5 -8.0 (7.0); b' = 4.5 -6.0 (6.0); c = 60.5-71.5 (64.5); c' = 0.6-0.8 (0.7); stylet = 23.0-25.5 (24.0) µm; V = 60.5-65.5 (62.5); G₁ = 17.0-19.5 (18.5); G₂ = 14.5-16.0 (15.5); dorsal oesophageal gland orifice at 3.0 – 4.0 (3.5) µm from stylet base; lip annule = 4; oesophageal length = 144.0-152.0 (148.5) µm from anterior end; nerve ring at 67.0-73.0 (70.5) µm from anterior end; excretory pore at 140.5 -143.5 (141.5) µm from the anterior end; tail = 9.5 -11.0(10.5) µm; diameter of scutella = 3.0 -4.5(4.0) µm; lateral lines = 4.

Male: Not found.

Habitat and Locality: Soil around the roots of *Leucas indica* (L.) R. Br. Valke, from Kyamgei, Phoubakchao; *Mimosa pudica* L. from Lilong Haoreibi, *Cassia fistula* from Thangmeiband Hijam Leikai, Imphal.

Remarks: The dimensions and morphological characters of the present specimens are within the range of *S. africanum* Smith, 1971^[6] except that they have slightly longer oesophagus and posteriorly located excretory pore.

Scutellonema clathricaudatum Whitehead, 1959^[9]

Females (12) : L= 0.66-0.84 (0.75) mm; a = 18.0-22.0 (20.0); b = 5.5 -7.0 (6.0); b' = 7.0-8.5 (8.0); c = 39.0-46.0 (41.0) c' = 0.65-0.85 (0.80); stylet = 24.0-26.0 (25.0) µm; V = 57.0-60.0 (58.0); G₁ = 16.0-18.0 (17.0); G₂ = 16.0-18.0 (17.0); lip annule = 5-6; dorsal oesophageal gland orifice at 5.0 – 6.0 (5.6) µm from stylet base; nerve ring at 81.0-88.0 (84.5) µm from anterior end; excretory pore at 98.0-122.0 (114.0) µm from the anterior end; tail = 16.0-19.0 (18.0) µm; diameter of scutella = 3.0 -4.0(3.5) µm.

Male: Not found.

Habitat and Locality: Soil around the roots of *Alpinia zerumbet* Burtt. & R. M. Smith and *Euoatorium birmanicum* DC. From Sagolband, Sagoltongba, Lamshang and Wangoi.

Remarks: The dimensions and morphological characters of the present specimens are similar with those described by Whitehead (1959) ^[9].

***Scutellonema commune* Van Der Berg & Heyns, 1973 ^[8]**

Females (5): L= 0.83-0.96 (0.89) mm; a = 25.0-31.0 (28.0); b = 5.5 -7.0 (6.5); b' = 5.5-7.0 (6.5); c = 43.0-54.0 (49.0) c' = 0.8-0.9 (0.8); stylet = 29.0 µm; V = 55.0-59.0 (57.0); G₁ = 24.0-33.0 (29.0); G₂ = 27; lip annule = 4-6; dorsal oesophageal gland orifice at 4.0 – 5.0 (4.6) µm from stylet base; nerve ring at 94.0-99.0 (96.5) µm from anterior end; excretory pore at 110.0-128.0 (118.0) µm from the anterior end; tail = 17.0-18.0 (18.0) µm; diameter of scutella = 3.0 -5.0(3.6) µm.

Male: Not found.

Habitat and Locality: Soil around the roots of *Cynodon dactylon* (L.) Pers. from Meitram, Imphal West, *Plectranthus ternifolius* D. Don from Chingmeirong Cheiraoching hill, Imphal, Manipur.

Remarks: The dimensions of the present specimens are within the range of measurement and have similar morphological characters with those given by Van Der Berg & Heyns (1973) ^[8].

***Scutellonema imphalus* Sultan & Jairajpuri, 1979 ^[7]**

Females (6): L= 0.64 – 0.70 (0.66) mm; a = 24.0 -26.5 (25.5); b = 6.0 -6.5 (6.0); b' = 5.0 -5.5 (5.5); c = 38.0-40.0 (39.0); c' = 0.7-1.0 (0.80); stylet = 26.0-28.0 (27.0) µm; V = 54.0-58.0 (56.0); G₁ = 18.0-20.0 (19.0); G₂ = 19.0-20.0 (19.5); dorsal oesophageal gland orifice at 8.0 – 9.5 (8.5) µm from stylet base; lip annule = 4-5; oesophageal length = 107.5-110.5 (109.0) µm from anterior end; excretory pore at 102.5-108.0 (104.5)µm from the anterior end; tail = 16.0-18.0 (17.0) µm; diameter of scutella = 4.5-5.6 (5.0)µm; lateral lines = 4.

Male: Not found.

Habitat and Locality: Soil around the roots of *Polygonum plebeium* R. Br., *Viola pilosa* Blume from Langthabal, Shamurou, Imphal West.

Remarks: The measurement and description of the present population conform with the description given by Sultan and Jairajpuri (1979) ^[7].

***Scutellonema sheri* Edward and Rai, 1970 ^[5]**

Females (20): L= 0.60 – 0.80 (0.65) mm; a = 18.0 -25.5 (21.0); b = 6.5 -8.5 (7.8); b' = 5.5 -6.5 (6.0); c = 32.0-51.5 (41.5); c' = 0.61-0.93 (0.78); stylet = 24.0-28.5 (26.5) µm; V = 54.0-56.5 (55.0); G₁ = 21.5-36.3 (30.0); G₂ = 17.0-25.5 (22.5); dorsal oesophageal gland orifice at 3.0 – 5.5 (4.5) µm from stylet base; lip annule = 3 oesophageal length = 104.0-132.5 (116.5) µm from anterior end; nerve ring at 67.0-73.5 (69.5) µm from the anterior end; excretory pore at 110.5-112.0 (111.0)µm from the anterior end; tail = 13.0-14.5 (14.5) µm; diameter of scutella = 3.0-4.0 (3.5) µm; lateral lines = 4.

Male: Not found.

Habitat and Locality: Soil around the roots of *Zizyphus mauritiana* Lamk. From Naorem Leikai, *Bauhinia purpurea* L. and *Eupatorium birmanica* DC. from Sagoltongba, Khongman, Yumnam Leikai, Sekmai, Kangchup, *Centella asiatica* from Lamshang.

Remarks: *Scutellonema sheri* is widely distributed in Manipur. The morphology and measurements of the present specimens conform with the descriptions given Edward and Rai (1970) ^[5] except slight difference in the value of a, c, V and diameter of scutella.

Conclusion

Scutellonema species are one of the parasitic nematodes and hidden enemies of plants. These nematodes feed on the roots of plants as ecto-parasites, exposing the affected root to other pathogenic microorganisms causing yield loss of the plant. The present work on the plant parasitic nematodes invading medicinal plants will provide the information of the phytonematodes that will help to control the plants for more productivity.

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