

NEW SPECIES OF NOTHOPODINE MITES (ACARI: ERIOPHYIDAE)
FROM NORTHEAST INDIA
WITH KEY TO INDIAN SPECIES

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ERIOPHYIDAE
NOTHOPODINAE
NEW SPECIES

SUMMARY: Three new species of eriophyid mites under subfamily Nothopodinae, viz., *Anothopoda micheliae* sp. nov. infesting *Michelia champaca* L., *Cosella meghalayensis* sp. nov. infesting *Combretum decandrum* L., and *Disella cumini* sp. nov. infesting *Syzygium cumini* (Linn.) are described from Meghalaya state in Northeast India. The affinities and relationships of the new species with other closely related congeners are provided. An account of the genus *Anothopoda*, *Cosella* and *Disella* have also been provided with a key for separating the Indian species.

INTRODUCTION

Subfamily Nothopodinae has been divided into two tribes viz. Colopodacini and Nothopodini (AMRINE JR., 1996). The genera *Anothopoda* Keifer (1959b), *Disella* Newkirk & Keifer (1975) and *Cosella* Newkirk & Keifer (1975) belong to the tribe Nothopodini. *Anothopoda* is distinguishable from all other genera under the same subfamily by the absence of prodorsal scapular setae and seta e. *Disella* and *Cosella* both have presence of prodorsal tubercles with setae and seta e. In case of *Disella*, coxal plates I separated by a prosternal apodeme line but in *Cosella* coxal plates are united with each other. AMRINE & STASNY (1994) listed 4, 8 and 6 species respectively, under the above 3 genera. Here, 3 new species, one each in *Anothopoda*, *Disella* and *Cosella* are described. It may be stated that the tribe Nothopodini is

represented now in India having 3 species of *Anothopoda*, 2 species of *Nothopoda*, 1 species of *Neocosella*, 6 species of *Floracarus*, 1 species of *Cosella* and 3 species of *Disella*.

All measurements are expressed in micrometers (μm). For females, each measurement of holotype followed the corresponding ranges for the paratypes.

All the slides bearing the type material are presently deposited in the collection of the Biosystematics Research Unit, Department of Zoology, University of Kalyani, Kalyani 741 235, India.

ANOTHOPODA MICHELIAE sp. nov.

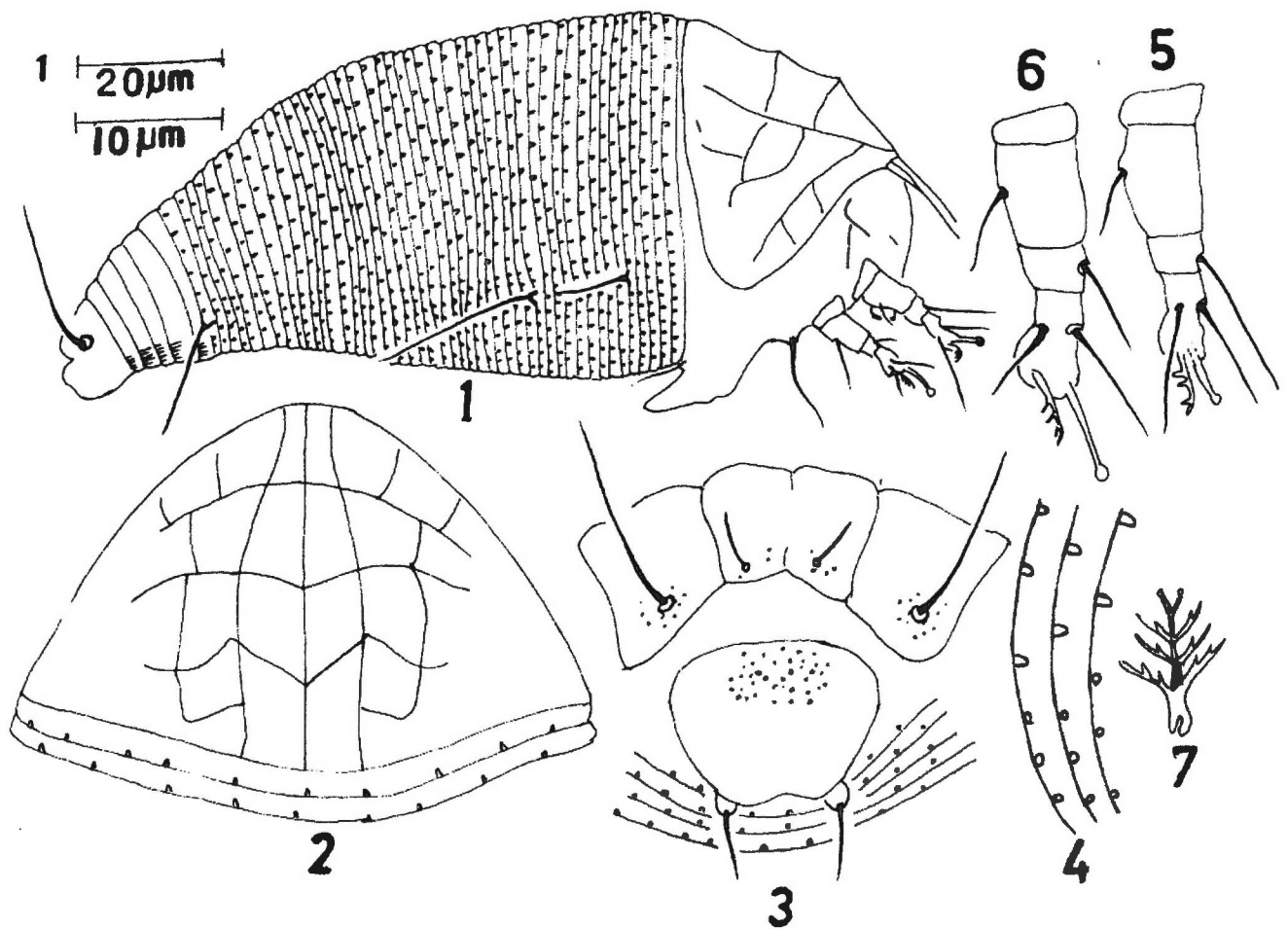
(FIGS. 1-7)

FEMALE: Body 139.3 (104.1-139.3) long, 48.7 (46.0-55.7) wide, conical, tapering. Colour life whitish to

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FIGS. 1-7. *Anothopoda micheliae* sp. nov.; 1.— Lateral view of body; 2.— Dorsal view of prodorsal shield; 3.— Ventral view of coxigenital region; 4. Lateral view of skin; 5.— Leg I; 6.— Leg II; 7.— Empodium.

pale yellow. Gnathosoma 14.0 (13.9-16.2) long, curved down with the dorsal pedipalp genual seta 4.6 long. Prodorsal shield 34.8 (34.8-41.8) long, 46.4 (39.4-53.4) wide, semicircular in anterior outline, somewhat declivitous in front, with very short blunt projection over gnathosoma base. Prodorsal shield design a network; median line present and complete, dividing the shield into half; on each half of shield, a transverse row of three closed and an open outer cell present along the anterior shield margin; behind these another three cells present, the outer one being open; penultimate row with three more cells; hind row bordering rear margin with two subequal inner cells; posterolateral angle of shield clear; prodorsal scapular tubercle and setae absent. Legs shortened with

tibiae and tarsi fused; leg I 20.9 (20.9-32.2) long; femur 6.9 (6.9-9.3) long with basiventral femoral seta 6.9 long; genu 2.3 long with antaxial genual seta 16.3 (16.3-20.8) long; tibiotarsus compact, 7.0 long with two bold paraxial and antaxial festigial tarsal setae, each about 16.5 long; tarsal solenidion 4.6 long, knobbed and slightly displaced laterally; empodium simple and 4-rayed. Leg II 18.6 (17.8-19.4) long; femur 4.8 (4.6-7.0) long with basiventral femoral seta 11.6 (11.6-13.9) long; genu 3.5 (2.3-3.5) long with antaxial genual seta 7.0 long; tibiotarsus 6.9 (5.8-6.9) long with paraxial festigial tarsal seta 16.2 long and antaxial festigial tarsal seta 12.0 long; tarsal solenidion 9.3 long, in normal dorsal position; other characters as in leg I. Coxal plates I almost fused; coxal

plates II nearly in the line with the coxal plates I with a few scattered granules on both coxal plates; 1b tubercles and setae absent; 1a setae 9.3 (6.3-9.3) long, lying distinctly below horizontal line across centre of coxal plates I and a little above that across 2a setae; 2a setae 13.9 (11.6-13.9) long.

Opisthosoma arching down gradually at the sides with faint median dorsal depression in some specimen; thanosome with nearly 52 (46-53) moderately wide dorsal annuli and almost as many ventral annuli; dorsal annuli with microtubercles slightly elongated and ventral annuli with close set, round to oval microtubercles aligned on the rear ring margin; telosome clear dorsally, microstriate ventrally. Seta c2 18.6 (14.0-20.8) long on about annulus six behind the rear prodorsal shield margin; seta d 46.4 (27.9-46.4) long on about annulus 16 (14-16); seta e absent; seta f 23.2 (18.6-23.5) long on about annulus 5-6 from the base of the caudal lobes; seta h2 present, seta h1 not visible. Genitalia 23.2 (18.6-23.2) wide, 11.6 (9.3-13.9) long; genital coverflap with a few scattered granules basally; genitalia at moderate distance behind coxal plates; seta 3a 4.6 long.

MALE: Observed, 116.0 long, 46.4 wide, with 13.9 wide and 11.6 long genitalia.

MATERIAL STUDIED. — Holotype: Female (marked) on slide (no. 959/59/1985); INDIA: Meghalaya: Burnihat, 17.x. 1985 from *Michelia champaca* L. (Anonaceae) coll. B. DAS. Paratypes: 50 females and 4 males on slide bearing holotype and on four other slides (nos. 960-963/59/1985), collection data as in holotype.

RELATIONSHIP WITH HOST: Mites found as under surface leaf vagrants showing no apparent damage symptom.

DISTRIBUTION: INDIA: Meghalaya.

REMARKS: So far, 5 species are known under the genus *Anothopoda* Keifer (1959b). *A. micheliae* sp. nov. comes close to *C. deviarensis* Mohanasundaram (1981) and *C. fici* Mohanasundaram (1982) in having 4-rayed empodium, genital cover flap with granules basally and structure of microtubercles but can be distinguished from *deviarensis* having knobbed tarsal solenidion and the details of prodorsal shield structure and from *fici* having a few scattered granules on

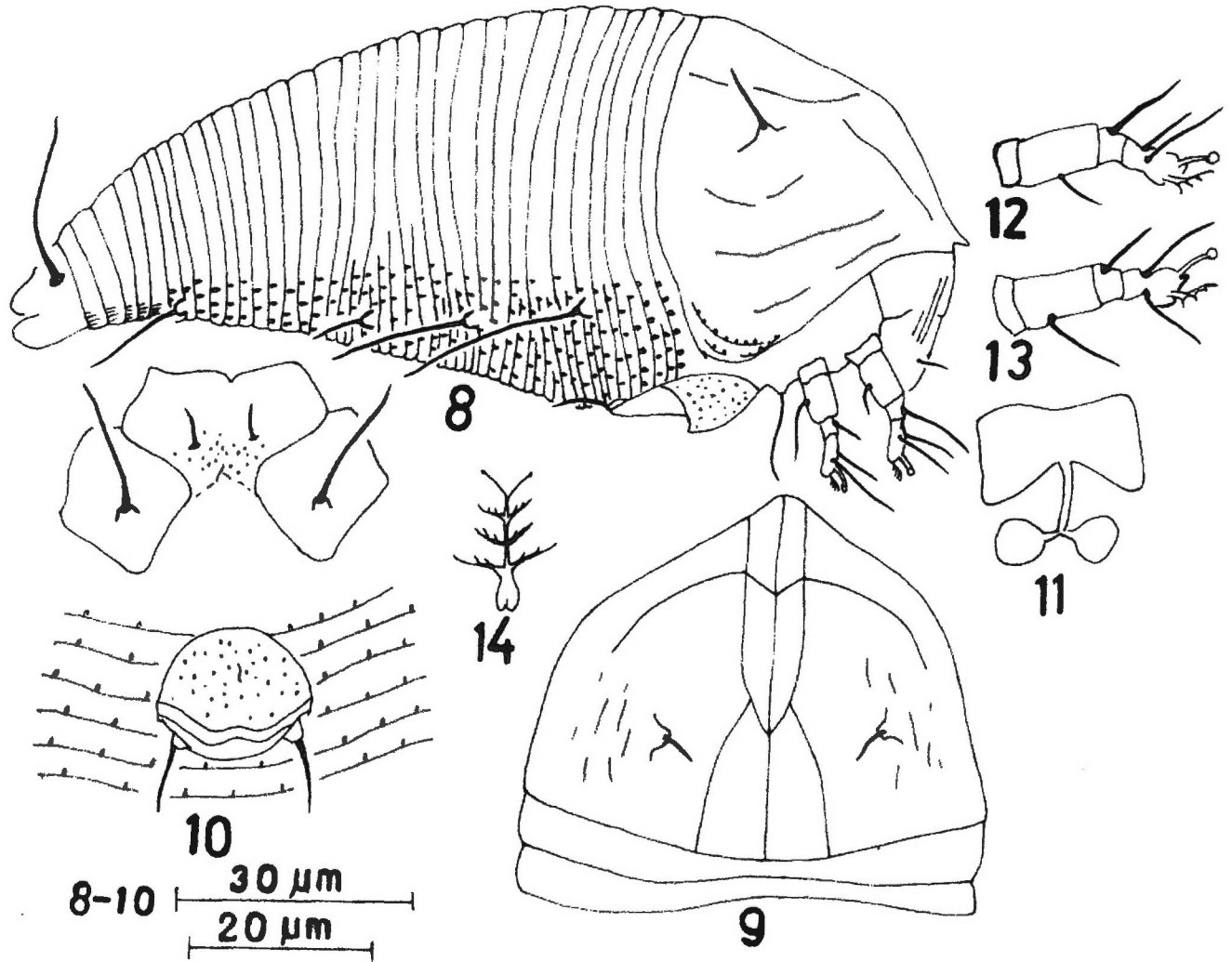
coxal plates, laterally displaced tarsal solenidion and genital coverflap smooth distally.

ETYMOLOGY: *micheliae* is from the specific designation of the host plant *Michelia champaca* L.

COSELLA MEGHALAYENSIS sp. nov.

(FIGS. 8-14)

FEMALE: Body 141.0 (124.6-141.0) long, 65.8 (63.8-65.8) wide, robust, fusiform and tapering. Colour in life whitish, older mites reddish brown. Gnathosoma 21.2 (18.8-21.2) long, pointing down with dorsal pedipalp genual seta 4.7 long. Prodorsal shield 35.3 (35.3-40.0) long, 61.1 (58.8-61.1) wide, anterior margin nearly semicircular with very short emerginate lobe over gnathosoma base. Prodorsal shield design of clear central lines; median line present, complete and continuous; admedian lines arise laterad of median line in the anterior prodorsal margin, run subparalal and curve in at 0.5 to meet median line; admedian lines also connected to median line at 0.2 by slightly diagonal cross lines and to the rear prodorsal shield margin by diverging lines, originating just ahead of 0.5 junction; submedian lines weak, originate in admedian lines at about 0.2, run along anterior margin of prodorsal shield and end in a few broken lines outside the prodorsal scapular tubercles; posterolateral angle of prodorsal shield obtuse, extending downwards, bearing two to three rows of granules; prodorsal scapular tubercles with longitudinal bases, 11.8 (9.4-11.8) ahead of margin, 28.2 (28.2-30.6) apart, directing dorsad, seta 11.8 (11.8-14.1) long. Legs stunted by fusion of tibiae and tarsi; Leg I 21.2 (18.8-23.3) long; femur 7.1 (7.1-9.4) long; genu 2.4 long with antaxial genual seta 23.5 (23.5-25.9) long; tibiotarsus 7.1 long, paraxial festigial tarsal seta 21.2 (21.2-22.9) long and antaxial festigial tarsal seta 18.8 (18.8-20.0) long; tarsal solenidion 7.1 (7.1-9.4) long, slightly displaced laterally, gently arched, with swollen apex; empodium simple, 4-rayed. Leg II 21.2 (18.8-21.2) long, femur 7.1 (7.1-9.4) long with basiventral femoral seta 14.1 (11.8-16.5) long, genu 2.4 long with antaxial genual seta 5.9 (5.9-7.1) long, tibiotarsus 7.1 (7.4-7.1) long with two unequal setae, paraxial festigial longer 21.2



FIGS. 8-14. *Cosella meghalayensis* sp. nov.; 8.— Lateral view of body; 9.— Dorsal view of prodorsal shield; 10.— Ventral view of coxogenital region; 11.— Apodeme; 12.— Leg I; 13.— Leg II; 14.— Empodium.

(18.8-21.2) long; tarsal solenidion 7.1 (7.1-9.4) long and in normal position; other characters as in the leg I. Coxal plates I fused, with no clear prosternal apodeme line; few scattered granules around base of coxal plates I only; 1b tubercles and setae absent; 1a setae 7.1 long, little below horizontal line passing through centre of coxal plates I and well above that across 2a coxal setae; 2a setae 14.1 long.

Opisthosoma arched down gradually at the sides, with a faint median depression on dorsum; thanosoma with about 27 (27-30) moderately wide dorsal annuli and 40 (40-43) narrow ventral annuli; dorsal annuli smooth, ventral annuli with round to oval

microtubercles resting on rear annuli margins, elliptical beyond the seta e; telosoma smooth dorsally and microstriate ventrally. Seta c2 16.5 (14.1-16.5) long, on about annulus 5 from behind the rear prodorsal shield margin; seta d 37.6 (30.6-37.6) long on about annulus 15; seta e 7.1 (4.1-7.1) long on about annulus 24 (24-25); seta f 14.1 (11.8-14.1) long on annulus 6 from the caudal lobes; seta h2 present, seta h1 absent. Genitalia 18.8 (18.8-23.5) wide, 14.1 (14.1-23.5) long, coverflap basally with broad band of granules, distally with a pair of centrally notched, semi-circular lines; internal genital apodeme as figured; seta 3a 9.4 (4.7-9.4) long.

MALE: Observed, 117.5 long, 71.0 wide, with 11.8 wide and 16.5 long genitalia; seta 3a 7.1 long.

MATERIAL STUDIED: Holotype: Female (marked) on slide (no. 1113/89/1985); INDIA: Meghalaya: Burnihat, 2. xi. 1985, from *Combretum decandrum* L. (Combretaceae), Coll. B. DAS. Paratypes: 10 females and few males on slide bearing holotype and on two others slides (nos. 1114-1115/89/1985), data as in holotype.

RELATIONSHIP WITH HOST: Mites were found, few in number on leaf undersurface, showing no apparent damage symptom.

REMARKS: So far, 7 species under the genus *Cosella* Newkirk & Keifer (1975) are known from different parts of the world including 1 species viz. *C. ichnocarpasia* Mondal & Chakrabarti (1981) from India. In having granulated genital coverflap, knobbed tarsal solenidion and complete median line on prodorsal shield, *C. meghalayensis* sp. nov. comes close to *C. deleoni* Keifer (1959a) and *C. szygia* Huang (2001) but can be differentiated from *deleoni* in having few granules on coxal plates I, 4-rayed empodium and from *szygia* having smooth coxal plates II, absence of h1 setae and coverflap with two curved semicircular lines distally.

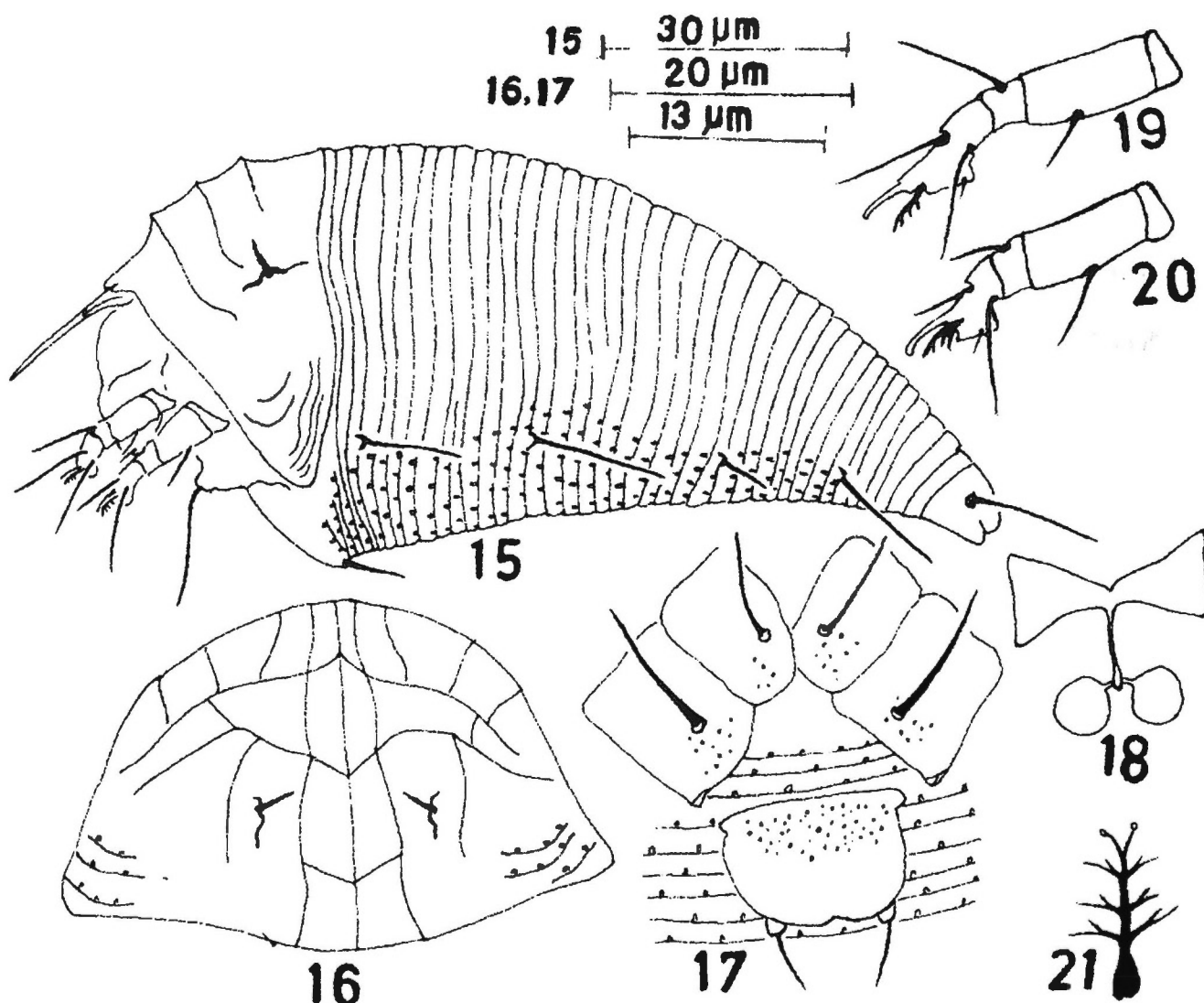
ETYMOLOGY: The name *meghalayensis* is given after the Indian state from which the specimens were collected.

DISELLA CUMINIS sp. nov.
(Figs. 15-21)

FEMALE: Body 139.2 (116.0-162.4) long, 60.3 (51.1-67.0) wide, robust, fusiform, tapering to rear. Colour in life whitish to creamish yellow. Gnathosoma 13.9 (12.3-16.2) long, curved down evenly with dorsal pedipalp genual seta 4.6 long; prodorsal shield 34.8 (32.1-41.8) long, 46.4 (39.4-53.4) wide, semicircular along the anterior margin with short, blunt emerginate lobe over gnathosoma base. Prodorsal shield design clear; median line complete; admedian lines gently sinuate, arise in anterior shield margin just laterad of median line, connected to it by diagonal cross lines at 0.25, 0.5 and 0.75; submedian lines originate in admedian lines at about 0.25, run along

lateral prodorsal shield margin, forming a transverse anterior row of five cells with it, the outer one being an open cell; a posterior branch of the admedian line arises from 0.5, sweeps outwardly and laterally, joining with submedian lines by a short diagonal connective, and sending a branch backwards just past dorsal scapular tubercle; posterolaterally prodorsal shield bearing three rows of dark granules; prodorsal scapular tubercles present, 7.0 (7.0-11.6) ahead of rear prodorsal margin, their bases longitudinal, 27.8 (23.2-27.8) apart, subtending prodorsal scapular setae 7.0 (4.7-7.0) long, dorsocentrad. Legs stunted by fusion of tibiae and tarsi; leg I 18.6 (18.6-23.2) long; femur 7.0 (6.0-9.2) long, with basiventral femoral seta 4.6 long; genu 2.3 (2.3-3.5) long with antaxial genual seta 20.9 (16.2-23.0) long; tibiotarsus 8.5 (6.9-8.5) long, paraxial festigial tarsal seta 23 long and antaxial festigial tarsal seta 16.5 long, paraxial unguinal tarsal seta one and fine; tarsal solenidion 3.5 (2.3-3.5) long, placed laterally, with apex round; empodium simple, 4-rayed. Leg II 16.2 (16.2-18.6) long; femur 7.0 (6.8-7.0) long; tibiotarsus 4.6 (4.6-5.8) long; paraxial festigial tarsal seta 23.0 (18.6-23.0) long and antaxial festigial tarsal seta 13.5 long and a fine paraxial unguinal tarsal seta; tarsal solenidion 3.9 (3.7-4.6) long; other details as in the leg I. Coxal plates I contiguous for a short distance centrally along a shortened midventral line; coxal plates with sparse granules scattered around coxal bases only; 1b setae absent, 1a setae 7.0 (4.6-7.0) long, opposite anterior approximation of coxal plates I and well above transverse line across 2a setae; 2a setae 11.6 (9.3-11.6) long.

Opisthosoma prominently arching downwards at the sides; thanosome with nearly 49 (46-50) moderately wide, smooth dorsal annuli and as many as or few more microtuberculated ventral annuli; microtubercles somewhat rounded in anterior 3-4 ventral annuli; elliptical behind; telosome smooth dorsally, microstriate ventrally. Seta c2 13.9 (13.9-16.2) long on about annulus 5 (5-7) behind rear prodorsal shield margin; seta d 23.2 (18.6-23.2) long on about annulus 15 (15-17); seta e 4.6 (4.6-7.0) long on about annulus 30 (28-30); seta f 18.6 (13.9-18.6) long on about annulus 5-6 from the caudal lobes; seta h2 present, seta h1 not visible. Genitalia 20.9 wide, 16.2 (12.0-16.2)



FIGS. 15-21. *Disella cumini* sp. nov.; 15.— Lateral view of body; 16.— Dorsal view of prodorsal shield; 17.— Ventral view of coxogenital region; 18.— Apodeme; 19.— Leg I; 20.— Leg II; 21.— Empodium.

long; coverflap with a band of faint granules basally; genital apodeme little shortened in ventral view; genitalia at moderate distance from coxal plates; seta 3a 4.6 long.

MALE: 162.4 long, 67.3 wide, with 16.2 long and 7.8 wide genitalia and 4.6 long seta 3a.

MATERIAL STUDIED: Holotype: Female (marked), on slide no. 1176/104/1985; INDIA: Meghalaya: Burnihat, 21.x.1985, ex. *Syzygium cumini* (Linn.) Skeels (Myrtaceae), coll. B. DAS. Paratypes: 40 females and few males on slide bearing holotype and on four other slides (nos. 1177-1180/104/1985), data as in

holotype; 15 females on slides (nos. 983-985/63/1985); INDIA: Meghalaya: Burnihat, 18.x.1985, ex. *Ficus* sp. (Moraceae), coll. B. DAS.

DISTRIBUTION: INDIA: Meghalaya.

RELATINSHIP WITH HOST: Mites are found on leaf under surface showing no apparent damage symptom.

REMARKS: In having 4-rayed empodium and prodorsal shield design represented by a transverse anterior row of cells, *Disella cuminis* sp. nov. comes close to *D. talisae* (Keifer, 1969), *D. vagrans* Mohanasundaram (1986) and *D. oblongifoliae* Ghosh B. et al.

(1986). However, *D. cuminis* sp. nov. is distinct from *talissae* and *vagrans* in having granulated coxal plates, round microtubercles on anterior 3-4 ventral annuli and elliptical microtubercles on posterior ventral annuli besides tarsal solenidion placed laterally with round apex, and from *oblongifoliae* in having granulated coverflap, smooth femur I, simple tarsal solenidion and dorsocentral scapular setae.

ETYMOLOGY: The name *cuminis* is from the specific designation of the host plant, *Syzygium cuminis*.

KEY TO INDIAN SPECIES OF *ANOTHOPODA*

1. Empodium 5-rayed; distinct prosternal apodeme
..... *wightianae* Mohanasundaram (1981)
- Empodium 4-rayed 2
2. Tarsal solenidion simple; coxal plates granulated; dorso-ventral annuli with elongated microtubercles
..... *deviarensis* Mohanasundaram (1981)
- Tarsal solenidion knobbed 3
3. Genital coverflap distally with crescentic scoring; median line incomplete on prodorsal shield
..... *fici* Mohanasundaram (1982)
- Genital coverflap with a few scattered granules basally; median line present and complete on prodorsal shield ..
..... *micheliae* sp. nov.

KEY TO INDIAN SPECIES OF *COSELLA*

1. Genital coverflap with a few irregular furrows; coxal plates ornamented with granules; median line absent on prodorsal shield
..... *ichnocarpasia* Mondal & Chakrabarti (1981)
- Genital coverflap basally with broad band of granules, distally with a pair of centrally notched, semicircular lines; coxal plates II smooth; median line complete and continuous on prodorsal shield
..... *meghalayensis* sp. nov.

KEY TO INDIAN SPECIES OF *DISELLA*

1. Coxal plates smooth; microtubercles on ventral annuli; coverflap granular with crescent scoring distally
..... *vagrans* Mohanasundaram (1986)
- Coxal plates granular 2
2. Tarsal solenidion knobbed 3
- Tarsal solenidion simple 4

3. Genital coverflap smooth. Femur granulated; prodorsal tubercles well ahead of rear prodorsal shield margin ...
..... *oblongifoliae* Ghosh, Mondal & Chakrabarti (1986)
- Genital coverflap with 8-10 longitudinal scoring on upper half; prodorsal tubercles little ahead of rear prodorsal shield margin
..... *tectona* Das & Chakrabarti (1982)
4. Dorsoventral annuli microtuberculated; genital coverflap coarsely granular
..... *granulacoxae* Mohanasundaram (1986)
- Ventral annuli microtuberculated; genital coverflap with faint granules basally *cuminis* sp. nov.

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