
**Phyllosticta dieffenbachiae** sp. nov.

Maculae foliae amphigenae, irregularae, pallidae flavae margin cum atra fulva, metiuntur 25–60 mm in longitudinem et 20–60 mm in latitudinem. Pycnidia amphigena, singulatim vel ceteratim (tres vel quartu simul), disseminata, paulo depressa, globosa, 90–240 μm in diametro, aequa cum singulo ostiolo totundo de 10–20 μm in diametro. Septum 1–4 cellae (15–20 μm) crassae, constitutum cellarum brunneola- rum part in crassitunicatam partim leptoderumarum, obscuriore et densiore circa porum, subtile hyalinum conidiogenam regionem versus. Cellae conidi- ogenae cylindraceae, 8–12 × 2–2.5 μm.

Pycnidiosporae unicellulares, ovoidae vel globosae cum fundamento truncato inventute, late rotundatae apicaliter, 8–14 × 5–8 μm, circumferentae mucosa lamina densa, continentes granulas virudilas cum breve ad longam appendicem.


2. **Phyllosticta dracaenica** sp. nov.

Leaf spots amphigenous, initially red on both surfaces, later centre turns to white with dark red margin, elongated, 2–35 mm in length and 2–20 mm in width. Pycnidia epiphyllous, scattered in group (3 together), somewhat depressed, globose, 120–150 μm in diam., with 15–30 μm wide pore. Wall 1–5 cells (10–15 μm) thick, brownish with thicker cell walls in the upper part and around the pore, hyaline and flattened towards the conidiogenous region. Conidiogenous cells cylindrical, 5–10 × 1.5–2 μm. Pycnidiospores one-celled, ovoidal, ellipsoid or pyriform, broadly rounded apically, 7–10 × 4–5.5 μm, surrounded by thick slime layer, containing greenish granules with apical appendage (figure 2).


**Phyllosticta dracaenica** sp. nov.

Maculae foliae amphigenae, primo superficiebus ambobus rufae, posterius media pars in albam vertitur margine cum rubido, productae, 2–35 mm in longitudi- dum atque 2–10 mm in latitudinem. Pycnidia epiphylla, dispersa, aggregata (trio simul), paulo depressa, globose, 120–150 μm in diametro, cum poro 15–30 μm lato. Septum 1–5 cellae (10–15 μm) densus, brunneolum crassioribus cum cellis septis in superiors parte et circa porum, hyalinum et applanatum regiones conidiogenae cylindraceae, 5–10 × 1.5–2 μm. Pycnidiosporae unicae, ovoidae, ellipsoidae vel pyriformes, late rotundatae apicaliter, 7–10 × 4–5.5 μm, cinulatae a crassa mucosa lamina, continentes granulas virudilas cum appendicula apicale.

In foliis vivis de *Dracaenae marginatae* Lam., Bhubaneswar (Orissa), 23.11.1977, D. Gupta, H.C.I.O. 32880.

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**OCCURRENCE OF SEXUPARAE AND SEXUAL MORPHS OF WOOLLY APPLE APHID (ERIOSOMA LANIGERUM HAUSMANN) IN SIMLA HILLS, INDIA**

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There are contradictory reports in the literature about the mode of reproduction of woolly apple aphid (*Eriosoma lanigerum* Hausmann) in India. In North America, heterogony (cyclic parthenogenesis) is the common mode of reproduction of this insect pest on elm (primary host) and apple or related plants (secondary hosts). However, in this subcontinent,
### Table 1

**Distinguishing characteristics of adult virginopara, sexupara and sexual morphs of woolly apple aphid**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Virginopara</th>
<th>Sexupara</th>
<th>Sexuals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oviparous female</td>
</tr>
<tr>
<td>1. Colour</td>
<td>Reddish brown</td>
<td>Head and thorax are dark black and abdomen is brown.</td>
<td>Reddish brown</td>
</tr>
<tr>
<td>2. Rostrum</td>
<td>Extends up to hind coxae.</td>
<td>Extends up to middle coxae.</td>
<td>Arostrate</td>
</tr>
<tr>
<td>3. Antenna</td>
<td>Six-segmented, primary rhinaria on last two segments.</td>
<td>Six-segmented, secondary rhinaria on last four segments.</td>
<td>Five segmented, primary rhinaria on last two segments.</td>
</tr>
<tr>
<td>4. Wings</td>
<td>Apterous</td>
<td>Alate (two pairs of wings)</td>
<td>Apterous</td>
</tr>
<tr>
<td>5. Tarsus</td>
<td>Two-segmented, distal segment has a pair of claws.</td>
<td>Two-segmented, distal segment has a pair of claws.</td>
<td>One-segmented having three pairs of long digitules, a pair of hair and a pair of claws.</td>
</tr>
<tr>
<td>6. Mode of reproduction</td>
<td>Parthenogenetic viviparous</td>
<td>Parthenogenetic viviparous</td>
<td>Sexual oviparous</td>
</tr>
<tr>
<td>7. Progeny</td>
<td>Parthenogenetic viviparae</td>
<td>Sexuals (males and oviparous females)</td>
<td>Egg</td>
</tr>
<tr>
<td>8. Body form</td>
<td>Elliptical or pyriform</td>
<td>Elongate</td>
<td>Elongate (bigger in size as compared to males)</td>
</tr>
</tbody>
</table>

Woolly apple aphid has completely adapted itself to apple plants and all the previous reports indicate that this insect pest generally reproduces parthenogenetically throughout the year. There is also no mention in the literature about the distinguishing morphological characteristics of different morphs of woolly apple aphid in India.

Preliminary information on the occurrence of sexual morphs from the Kashmir valley also needs further confirmation as the occurrence of sexual morphs in Simla, Solan and Kulu (Himachal Pradesh) has been denied by other workers. Observations were made both in natural populations of this insect pest in the apple orchards around Simla Hills as well as in the laboratory culture maintained on apple nursery plants under (12L:12D).

In the present investigations, the different morphs recorded in nature and under laboratory conditions are virginoparae, sexuparae and sexuals; the latter two morphs are reported for the first time from this region. Their main distinguishing morphological characteristics are summarised in Table 1.

**Virginoparae:** Virginoparae occur throughout the year. These are apterous parthenogenetic viviparous females and their progeny consists of parthenogenetic viviparous females only. Four moult occur resulting in five instar stages. Nymphal stages are very active as compared with adult individuals.

**Sexuparae:** These are the only alates recorded on apple plants and appear from July to November. These are viviparous and parthenogenetic. Sexuparae are male–female producers and they lay sexuals (males and oviparous females).

**Sexuals:** These also appear from July to November. Sexuals (males and oviparous females) are apterous, arostrate and undergo four moult before they become sexually mature. Sexual dimorphism is also observed. There is a pair of claspers at the posterior end of the male and in between these protrudes the aedeagus. In the female, a single egg can be seen inside the abdomen from first instar to adult stage.

Present observations contradict earlier reports that the sexual morphs do not occur in Himachal Pradesh. It is interesting to note that the sexuals have degenerate mouth parts (arostrate) and survive presumably on the stored reserves in the body. Egg occupies the whole of the abdomen of the oviparous female and this stage appears as 'a walking egg'. The egg is laid at the base of leaves and tender shoots and is
covered with wax secreted from the special wax glands of oviparous female, which dies in the process of egg laying. A significant finding is that the sexuals do not increase in body size from first instar to adult stage.

It is quite striking to note the occurrence of virgino-parae, sexuparae and sexual morphs in the same region from July to November. The role of different environmental factors and the cytotaxonomic mechanisms involved in the production of different morphs in this aphid species are still unknown; however, the present findings are useful in stimulating further work on these aspects in the woolly apple aphid.

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OCCURRENCE OF THELEPHORA TERRESTRIS IN INDIA

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During a survey of fungi in mycorrhizal association with Pinus patula in Kodaikanal, Tamil Nadu, we collected sporophores of Thelephora terrestris in two consecutive seasons. This fungus has been known to produce ectomycorrhizae with Pinus elliottii, P. virginiana, P. strobos, P. rigida, P. echinata, P. palustris, P. clausa, P. sylvester, P. lambertiana, P. monticola, P. ponderosa, P. michoacana, P. teocote, P. rudis, P. pseudostrobos, P. ayacahite, P. leiophylla, P. taedea, Arbutus menziesii, Arctostaphyllos ursa-ursi and Picea stichensis. It is possible that T. terrestris is in mycorrhizal association with Pinus patula in the Kodaikanal area and further experimental work is in progress. Since T. terrestris has not so far been reported from India a description of the fungus is given below. The colour terminology used is that of Kornerup and Wanscher12. The specimens are deposited at the Herbarium of Madras University Botany Laboratory (MUBL).

Thelephora Terrestris Fr., Syst. Mycol. 1: 432 (1921)

Pileate, sessile to sub sessile, in imbricating rosettes, effuso-reflexed, up to 10 cm broad in masses. Pileus up to 5 cm broad, ascending, tomentose to fibrillose scaly, soft, dark brown (6F6–8F5); margin incised. Hyphenum inferior, papilllose, greyish brown (8D3) or chocolate brown (5F4). Context up to 2 mm thick, greyish brown (8D3). Spore print colour brownish grey (4D2). Spores 8.4–11.2 × 5.6 – 8.4 μm, angularly ellipsoid, lobate, smooth to echinate, spines very small, guttulate. Basidia 35.0–70.0 × 7.0–11.2 μm, 4-spored, sterigmate up to 7.0 μm long, thin walled, hyaline. Cystidia absent but basidia present, brown in 10% KOH. Hyphae 4.2–11.2 μm diam., branched, thick walled (up to 1.4 μm thick), with clamp connections, brownish in 10% KOH, hyphal fibrils turning dark brown in 10% KOH.


On ground, in groups, Pinus patula plantation, Kundar, Kodaikanal, Tamil Nadu, 21 December, 1979, Coll. K. Natarajan and N. Raman. Herb. MUBL No. 2671.

Corner13 recognised 6 forms under this species. The present collections agree with T. terrestris f. terrestris because of the sessile, effuso-reflexed, dark brown pileus.

The authors are extremely thankful to Prof. C. V. Subramanian for encouragement.

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