SHORT COMMUNICATIONS

SOME NEW HOSTS OF MACROPHOMINA PHASEOLI (MAUBL.) ASHBY

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Macrophomina phaseoli (Maubl.) Ashby, a root rot causing fungus is world wide in distribution occurring on a large variety of plants.[1] In Pakistan it is known to produce charcoal rot or root rot on 41 hosts belonging to 17 different families causing considerable damage to many plants of economic importance.[2,3] The fungus has subsequently been collected on the hosts as shown in Table 1. Of these *Asphodelus tenuifolius*, *Eruca sativa* and *Euphorbia* sp. appear to be new hosts of the fungus not hitherto recorded, whereas *Cosmos sulphureus*, *Ipomoea batatas*, *Melilotus parviflora* and *Lactuca* sp. are the new hosts from Pakistan. The latter two hosts, however, have been reported in the proceedings of the 12th and the 13th Pakistan Science Conferences.[4,5] This also adds two more families (Liliaceae and Convolvulaceae) as hosts of the fungus in Pakistan.

The affected plants became conspicuous due to wilting and showed symptoms of root rot. The bark decayed inside the ground and on uprooting was found to be studded with dark coloured sclerotia of the fungus on its under-surface and also on the roots. On *Ipomoea batatas*, however, the tuberous roots showed shrinkage from outside and the whole inside tissue turned black containing sclerotia of the fungus.

Under the microscope the sclerotia were rather smooth, more or less rounded to elongated. The average size of sclerotia and their range in size is shown in Table 2.

Table 1.—Some New Hosts of *Macrophomina phaseoli*.

Host/Family	Locality	Date of collection	Collected by
Asphodelus tenuifolius (Liliaceae)	Karachi	11-5-57	A. Ghaffar
Cosmos sulphureus (Compositae)	,,	31-12-60	,,
Eruca sativa (Cruciferae)	Tandojam	7-3-61	,,
Ipomoea batatas (Convolvulaceae)	Bahawalpur	16-6-61	,,
Melilotus parviflora (Leguminosae)	Rahimyarkhan	28-4-56	,,
Euphorbia sp. (Euphorbiaceae)	Quetta	6-7-61	,,
Lactuca sp. (Compositae)	Karachi	6-6-57	R. Mirza

Pycnidial stage of the fungus was observed on *Lactuca* sp. only. The pycnidia measured 145-232.0 μ × 116-203.0 μ (Av. 180.0 μ × 160.9 μ) and the pycnospores were 13.6-20.4 μ × 6.8 μ

TABLE 2.—MEASUREMENTS OF SCLEROTIA OF *Macrophomina phaseoli* ON DIFFERENT HOSTS.

Host	Size of sclerotia (μ) Average	Range
Asphodelus tenuifolius	78.3×68.1	72.5–87.0×58.0–72.5
Cosmos sulphureus	85.5×59.3	69.0–110.4×41.4–69.0
Eruca sativa	80.0×73.1	55.2–96.6×55.2–96.6
Ipomoea batatas	86.9×73.1	55.2–124.2×55.2–96.6
Melilotus parviflora	99.3×79.9	55.2–138.0×55.2–96.6
Euphorbia sp.	89.7×77.2	55.2–124.2×41.4–124.2
Lactuca sp.	64.8×52.4	41.4–82.8×41.4–82.8

(Av. 17.0 × 6.8 μ). It may be mentioned that till now the pycnidia were reported on *Cajanus cajan*, *Corchorus capsularis*, *C. olitorius*, *Phaseolus vulgaris*, *Sesamum indicum*,[6] *Citrullus vulgaris*, *Glycine max*, *Sesbania macrocarpa*, *Solanum tuberosum*,[1] *Ricinus communis*,[2] and *Gossypium* sp.[7]

Macrophomina phaseoli appears to be ubiquitous as a total number of at least 301 host plants are reported from different parts of the world. [1,2,3,8] Studies are in progress to see if the different isolates of *Macrophomina phaseoli* belong to same strain or to a group of strains of the fungus with regard to its morphology, physiology and parasitism.

References

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EFFECT OF STEAMING ON THE EXTRACTIVES OF GURJAN (DIPTEROCARPUS Spp.)

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Introduction

The primary Species in the Hill Tract forests of East Pakistan are Gurjans, comprised of *Dipterocarpus pilosus*, *D. turbinatus*, *D. alatus*, and *D. scaber*. Of these, *D. pilosus* and *D. turbinatus* are the principal species in the Kassalong Reserved Forest, which is the primary source of industrial timber. The genus is known to be resinous and the essential oils obtained from several species form the basis of commercial operations in other countries of south east Asia. Historically, the 'oil' obtained from *D. turbinatus* was collected and processed on a small scale. While this industry is of relatively little importance at present, the timber itself has become more important in the economy of East Pakistan.

In connection with the studies conducted to evaluate the treating properties of Gurjan railway sleepers it was found by Husain and Wallin[1] that pre-steaming increased absorption and penetration of 40:60 petroleum oil-creosote mix by 25% as compared with unsteamed stock. Other studies on bleaching of furniture wood, seasoning and gluing encountered problems associated with the resinous nature of Gurjan. As a result of these findings and observations, this preliminary study was made to determine if steaming had any significant effect on the quantity of extractives existing in the wood.

Experimental

From each of six gurjan logs, one board 1″ × 10″ × 10′ was taken from the heartwood, adjacent to the sapwood. All boards were air-dried and conditioned to an equilibrium moisture content of 12%. Three boards were selected at random for steaming at 160°F. steam temperature for 2½ hours under a 20″ vacuum and three more boards were selected for no steaming. Three samples were taken from each board at quarter points of the length, ground in a Wiley mill to pass a 40 mesh screen and be retained on a 60 mesh screen, thoroughly mixed, and stored in air-tight containers. The samples were drawn from the containers for extractive analysis in accordance with the procedures of the American Society for Testing Materials[2] as indicated in Table. 1.

Results

Analysis of variance on all data showed that the difference between steamed and unsteamed stock was highly significant for all solvents except cold water, as shown in Table 2.

TABLE 1.—SOLVENTS EMPLOYED FOR EXTRACTIVE ANALYSIS OF GURJAN.

Solvent	Components removed
Cold water	.. Tannins, polyphenolic cyclitols, sugars, polysaccharides, organic salts, pigments
Hot water	.. Cold water components, polymerized tannins, phlobaphens
Alcohol-benzene	.. Gum, resins, waxes, terpinoides
Ether	.. Fats, resins, waxes, sterols
Petroleum-ether	.. Fats, lipids, terpinoides
Total	.. Determined by successive extraction with alcohol, alcohol-benzene mixture and hot water

TABLE 2.—SUMMARY OF ANALYSIS OF VARIANCE FOR EXTRACTIVE CONTENT OF GURJAN BEFORE AND AFTER STEAMING.

Source	df.	Solvent: Cold water Mean sq.	f.	Hot water Mean sq.	f.	Alcohol benzene Mean sq.	f.	Ether Mean sq.	f.	Petroleum ether Mean sq.	f.	Total Mean sq.	f.
Treatment	1	.56	.30	5.93	24.80**	23.3	2993.00**	8.58	150.00**	30.1	38.80**	51.40	494.00**
Trees	4	118.00	425**	.24	3.90*	.01	.06	.06	4.25*	.8	11.90**	1.04	13.20**
Sample	12	.004	—	.0	.06	—	.13	—	.01	—	.06	—	.08	—
f. 05		(1×4) = 7.71;			4×12 3.26		f.01(1×4)=21.20;			(4×12)=	5.41		

*Significant ** Highly significant.

Table. 3 shows that there was a decrease in extractive content of steamed stock relative to unsteamed of 37.4% for alcohol-benzene, 41% for ether, 48% for petroleum-ether, and 30% for total extractives. Hot water solubility increased by 45.6%. It is also to be noted that the variance, relative to the mean, increased for cold water and alcohol-benzene, and decreased for all other solvents.

TABLE 3.—SUMMARY OF AVERAGE EXTRACTIVE CONTENT FOR VARIOUS SOLVENTS TOGETHER WITH CO-EFFICIENT OF VARIATION.

	Treatments: Steamed Average %	Steamed Coefficient of variation %	Unsteamed Average %	Unsteamed Coefficient of variation %
Cold water ..	1.60	55.3	1.25	23.8
Hot water ..	3.67	10.7	2.52	9.9
Alcohol-benzene ..	3.27	6.1	5.23	7.8
Ether ..	2.46	5.5	4.15	3.9
Petroleum ether ..	2.09	25.1	4.02	9.9
Total* ..	5.06	13.3	7.32	8.1

*Successive extraction with alcohol, alcohol-benzene and hot water.

Conclusion

1. Steaming removes significant quantities of the organic soluble fractions of the extractive primarily from the ray cells.
2. This results in improved treatment by permitting more preservative to penetrate to a greater depth.
3. The apparent increase in hot and cold water solubility is due to the sharp decrease in organic soluble components.

References

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