

## PESTS AND DISEASES OF QUARANTINE IMPORTANCE TO RUBBER CULTIVATION IN SOUTH EAST ASIA

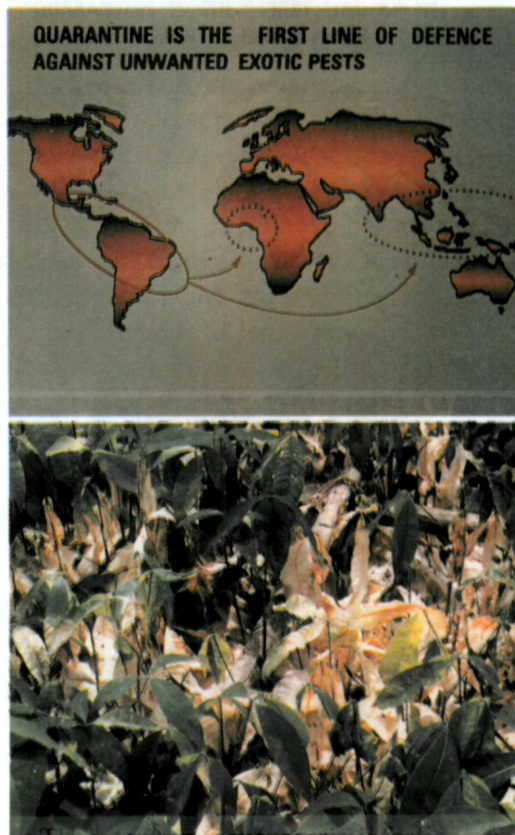
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### SUMMARY

South East Asian rubber growing countries are free from certain pests and diseases which affect rubber in South American region. The first line of defence against new arrivals of these exotic pests is the enforcement of strict quarantine regulations. In this article symptomatology and geographical distribution of two insect pests namely *Erinyis ello* and *Leptopharsa hevea* and five fungal pathogens viz. *Microcyclus ulei*, *Thanatephorus cucumeris*, *Phyllachora huberis*, *Fusicoccum* sp. and *Phytophthora capsici* of quarantine importance to rubber cultivation in South East Asia are described with the view of increasing the awareness of Quarantine Officers, Hevea Pathologists and Extension Officers.

### Key words:

*Hevea brasiliensis*, plant quarantine, South American rubber diseases.



*Thanatephorus cucumeris* infection on rubber seedlings in Sri Lanka. This fungus is considered as a pest of quarantine importance to rubber cultivation in African and Asian continents.

The rubber industry is of vital importance to the economy of South East Asia. In Sri Lanka next to tea, it is the most important commodity being the second major contributor to agricultural export earnings and employment generation. This industry provides employment for nearly 500,000 persons both directly and indirectly. The total area of land under rubber in Sri Lanka is reported to be 162,000 hectares representing around 9 percent of the total cultivated area.

As in all other agricultural crops pests and diseases are one of the major constrain for the development of this industry. The incidence and relative importance of the diseases vary between countries and regions. For instance several devastating pests and diseases which affect rubber in Tropical American region are not known to Asian continent. Recently, Plant Protection Group of the International Rubber Research and Development Board recognized two such fungal pathogens apart from South American Leaf Blight and two insect pests of quarantine importance to Asian continent and appealed them to be cautious despite of their economic threat and also as the knowledge on these pests are limited (Anon, 1996). Arrival of these new pests is a matter of concern because they can rapidly develop into destructive proportions in the absence of natural enemies in the new environment.

The first line of defense against new arrivals of exotic pests is the enforcement of strict quarantine regulations. For plant quarantine to be fully effective, team work is essential at the outer perimeter of the island. This team work involves Custom Officers as well as Quarantine Officers. It is a well accepted fact that quarantine is the best management strategy because once a pest or disease is established it is difficult, if not impossible to eradicate. Once the exotic pest get established, the control of a particular pest or disease remains a permanent cost to the industry concerned.

The aim of this article is to educate Quarantine Officers, *Hevea* Pathologists and Extension Officers on symptomatology and geographical distribution of exotic pests identified as potential threat to South East Asia with special reference to Sri Lanka. The Author surveyed the available literature from South America and Asia (Weir, 1926; Chee & Wastie, 1980; Chee & Holliday, 1986; Radziah, 1987; Radziah & Chee, 1989; Chee, 1990; Jayasinghe, 1993; Anon, 1996) and information on economically important exotic pests are provided in tabular form for the convenience of the reader.

## Pests and Diseases of quarantine importance to Asian rubber growing countries

Name of the disease	Causal agent	Endemic areas	Comments
<b>SOUTH AMERICAN LEAF BLIGHT</b>	<i>Microcyclus ulei</i>	Brazil, Bolivia, Colombia, Peru, Venezuela, Guiana, Surinam, Trinidad, French Guiana, Trinidad, Tobago, Haiti, Panama, Costa Rica, Nicaragua, Salvador, Honduras, Guatemala, Belize and Mexico	The most devastating disease of Para rubber. Symptoms vary with the stage of the leaf maturity at the time of infection. The first visible symptoms of the disease are the slight crinkling and distortion of the young copper brown leaflets. This is followed by dull, velvety lesions which are olive to greyish green in colour, usually on the lower surface. If the infection is heavy the young leaf soon blackens, shrivels and falls. The lesions of the remaining leaves will enlarge and pycnidia, dark coloured raised structures are formed on the upper surface of the maturing leaflets. With the maturity of the leaves the centre of the lesions turns papery white and eventually these tissues are torn-off leaving a shot-hole.
<b>TARGET LEAF SPOT</b>	<i>Thanatephorus cucumeris</i>  (Anamorph: <i>Rhizoctonia solani</i> )	Brazil, Bolivia Colombia, Guatemala, Costa Rica, French Guiana, Peru. A common disease in the Amazon region and regarded as second dangerous disease of rubber in this region (The disease has also reported from India, Nigeria, Thailand and recently in Sri Lanka. But no defoliation of rubber occurs in these countries due to the disease).	Young leaves are more susceptible. The first visible symptoms are small translucent circular spots of about 2-10 mm on the abaxial leaf surface normally with drops of latex. Later mycelia appear on the leaf surface giving purplish appearance. The most conspicuous symptom in nursery plants is the appearance of a net work of silvery mycelium on the affected leaves, petioles and stems.

Name of the disease	Causal agent	Endemic areas	Comments
<b>BLACK CRUST (BLACK SCAB, TAR SPOT)</b>	<i>Phyllachora huberi</i>  (Syn: <i>Catacauma huberi</i> )	Brazil, Bolivia, Peru, Suriname, Guiana, Trinidad and Tob ago	Though the young leaves are susceptible, symptoms appear only in mature leaflets. The first symptom is the development of chlorotic lesions on the abaxial surface. Later brilliant brown masses of stromas could be seen forming a concentric circle around green leaf tissue with a single fungal stroma or black spot at the centre. Defoliation of the affected leaves occurs during wet weather.
<b>FUSICOCCUM LEAF BLIGHT</b>	<i>Fusicoccum</i> sp	Malaysia	The lesions resemble those of rubber anthracnose disease, but the affected portions are more extensive with the target like concentric zones. Lesions are prominent on upper surfaces of fully expanded leaves. The rows of dots on lesions are made up of black partially embedded pycnidia. On incubation under high humidity salmon-coloured spore masses, sometimes forming a long coil oozed out from pycnidia. These spores are of two distinct sizes. Affected leaves gradually turned bronzed prior to abscission.
<b>PHYTOPHTHO RALEAF WITHER</b>	<i>Phytophthora capsici</i>	Brazil	Green shoots are the most susceptible parts rather than the leaves. Young leaves wither and remain attached to the dead or dying shoot tip, although the leaves themselves are not attacked. Both young and mature plants are affected and dried leaves could be seen hanging downward on mature trees during epidemics.

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MANDAROVA (SPHINGID MOTH) ATTACK	<i>Erinyis ello</i>	Central & South America and North America	Insect lays its eggs on the undersurface of the leaves. At first the larva feeds on the tender terminal shoots and young leaves and later on mature leaves and even the bark of the young stems. Repeat attacks cause severe defoliation.
LACE BUG ATTACK	<i>Leptopharsa heveae</i>	Brazil.	The insect infects rubber leaves causing premature defoliation.

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### REFERENCES

- Anon (1996). Rubber pests and diseases of quarantine importance to Asian rubber growing countries. Technical document No 11<sup>th</sup> SALB/96/WP/6. Association for the Natural Rubber Producing Countries, Kuala Lumpur, Malaysia.
- Chee, K H (1990). Present status of rubber diseases and their control. *Review of Plant Pathology* 69, 423-431.
- Chee, K H and Holliday, P (1986). South American leaf blight of *Hevea* rubber: Monograph. Malaysian Rubber Research and Development Board, Kuala Lumpur, Malaysia, 50 pp.
- Chee, K H and Wastie, R L (1980). The status and future prospects of rubber diseases in Tropical America. *Review of Plant Pathology* 59, 541-548.
- Jayasinghe, C K (1993). The natural occurrence of *Thanatephorus cucumeris* leaf spot on *Hevea brasiliensis* in Sri Lanka.

Radziah, N Z (1987). A new anthracnose disease of rubber. *Proceedings of the International Rubber Research and Development Board Pathology Group Symposium*, Chaing Mai, Thailand, 70-73.

Radziah, N Z and Chee, K H (1989). A new foliar disease of rubber. *Plant Pathology* 38, 293-296.

Weir, J R (1926). A pathological survey of the para rubber tree (*Hevea brasiliensis*) in the Amazon valley. *United States Department of Agriculture Bulletin* No. 1380, 130 pp.