A NEW LEAF BLIGHT DISEASE OF GROUNDNUT CAUSED BY *ALTERNARIA TENUISSIMA* (KUNZE. FR) WILTSHIRE IN KARNATAKA

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A new leaf blight disease of groundnut on bunch variety DH-3-30 was observed in the experimental fields of Agricultural Research Station, Ankola. The disease appeared during November 1986, when the crop was about 40–45 days old. The symptom of the disease was blighting of apical portions of leaflets with light to dark brown discoloration, which progressed later to the middle of the leaflets with yellow halo (figure 1).

The pathogen associated with this symptom was isolated from the diseased leaves and maintained in pure culture on potato dextrose agar medium. Colonies on potato dextrose agar were dark brown, fluffy with smooth margin. The mycelium was branched, septate, pale brown and 3.52–4.84 μm (av. 4.18 μm) in width. Conidia were pale to golden brown, oval to ellipsoidal, tapering gradually to form a beak swollen at the apex, had 2–5 transverse and 0–3 longitudinal septa, and measured 21.12–68.42 × 8.1–17.38 μm (av. 38.00 × 11.88 μm).

The fungus was identified as *Alternaria tenuissima* (Kunze. Fr) Wiltshire and deposited in CBSC, Baarn, Netherlands.

The pathogenicity test was done by spraying the spore suspension along with mycelial bits using an atomizer on 45-day-old DH-3-30 plants grown in earthen pots (12 × 14 cm). The characteristic blight of apical portions of leaflets with light to dark brown discoloration appeared within 12 to 15 days after inoculation. Re-isolation was made from the inoculated plants showing typical blight symptoms. The fungus so isolated agreed in its morphological features with the original culture.

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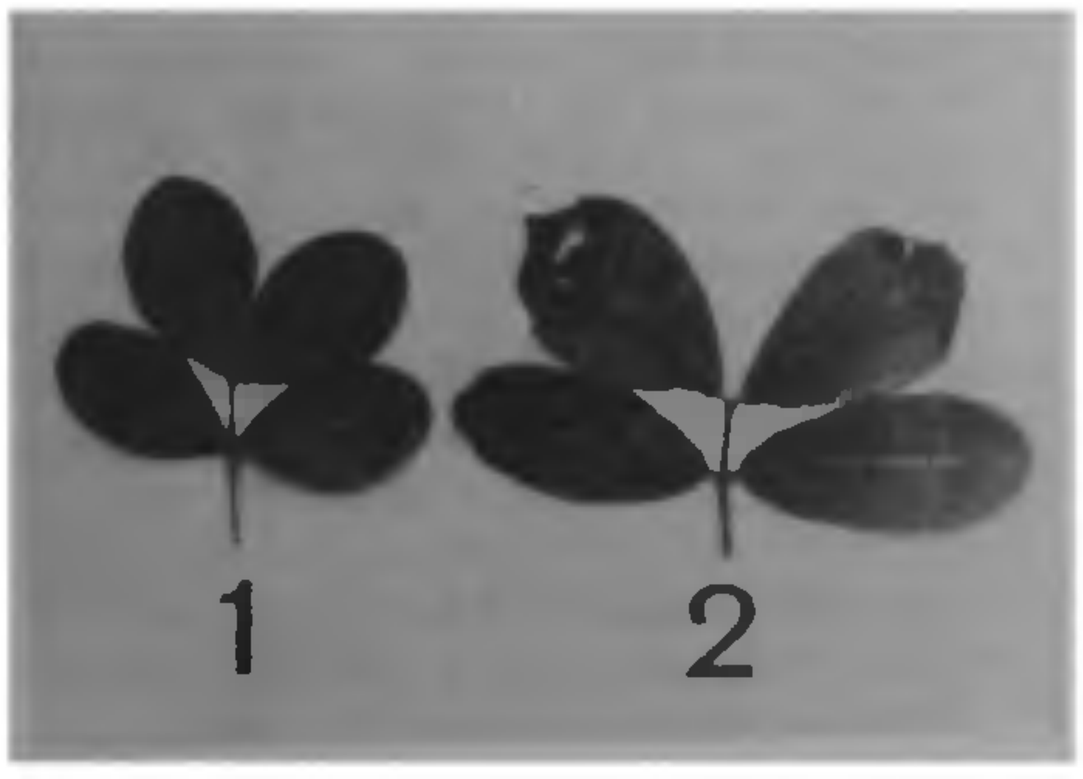

Figures 1 and 2. Healthy (1) and diseased (2) leaves of groundnut.

SALINITY-INDUCED CHANGES IN PHENOL AND ASCORBIC ACID CONTENT IN GROUNDNUT (*ARACHIS HYPOGEA*) LEAVES

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A wide variety of stressed conditions can influence pathogenesis of disease in plants. These include soil alkalinity and acidity, deficiencies of Cu or Zn and excess of $CaCO_3$, Na or K, a shift in favour of nitrogen metabolism relative to carbohydrate metabolism, and pesticide application[1]. All these conditions promote pathogenesis of disease in plants. Conversely accumulation of carbohydrates and ascorbic acid in plant tissues and application of Zn to the soil seem to reduce susceptibility to different pathogens[2]. Another mechanism by which plants can resist pathogens is by the production and accumulation of phenols which can interfere with the growth and multiplication of the pathogen[3–5]. Such phenolic compounds have been called prohibitins[6].

Groundnut, an important oil crop, is susceptible to a wide variety of pathogenic fungi that infect different parts of the plant[7]. Since salinity stress may promote pathogenesis[1], the levels of phenols and ascorbic acid have been studied in the leaves of groundnut plants grown under saline conditions.

Groundnut seeds (G2) were obtained from Tamil Nadu Agricultural University, Coimbatore. The plants were grown by pot culture. Both test and control plants were given distilled water. In the case of the test group, salinity was introduced by using 0.1 M NaCl solution on the 7th and 14th days. The estimations were carried out in the leaves at the end of the third week. Quinones and phenols were estimated according to Mahadevan[8]. Ascorbic acid

Table 1 *Effect of salinity stress on levels of phenols, quinones and ascorbic acid and activity of polyphenol oxidase in groundnut leaves*

Parameter	Control	Stress
Total phenols (mmol g)	3 96 ± 0 13	5 48 ± 0 26
o-Dihydric phenols (mmol g)	2 83 ± 0 05	4.11 ± 0 16
Quinones (mmol g)	1 64 ± 0 06	0.062 ± 0 003
Ascorbic acid (mg% o)	23 86 ± 0.84	9.75 ± 0.33
Polyphenol oxidase (ΔOD 30 sec/g)	4 43 ± 0.16	2 51 ± 0 08

Values are mean ± SE ($n = 6$).

from leaves was extracted with 4% oxalic acid and determined by the method of Roe[9]. Polyphenol oxidase was extracted according to Azhar and Krishnamurthy[10] and assayed according to Mayer *et al*[11].

The results obtained are given in table 1. The total phenols and o-dihydric phenols were increased in the test group. Quinone and ascorbic acid were decreased. Polyphenol oxidase activity in the saline group also was lower compared to that in the control group. The higher levels of phenols and lower levels of quinones in the leaves of the salinity-stressed plants can be explained on the basis of the lower activity of polyphenol oxidase[12]. Ascorbic acid has been implicated in the reduction of quinones to phenols[13]. The present studies indicate that the role of ascorbie acid in phenol formation may be minimal. It has been reported that, under stress conditions, the metabolism of a significant portion of carbohydrates switches from glycolytic to the pentose phosphate pathway mode, thereby leading to accumulation of phenols synthesized via the shikimate pathway[14]. The utilization of phenols for lignin formation involves the enzyme peroxidase[15]. Studies in this laboratory have shown that this enzyme is decreased in groundnut leaves and cotyledons during stress[16,17]. Thus the protecting accumulation of phenols may be due to the combined operation of three factors—decreased conversion of phenols to quinones by polyphenol oxidase, increased oxidation of carbohydrates via pentose phosphate pathway and decreased utilization for lignin formation. The accumulation of phenols may also compensate for the decrease in ascorbic acid, which also has a protective role[2]. The reduced activity of polyphenol oxidase, in addition to allowing phenols to accumulate, has the additional effect of keeping the level of quinones in check. Quinones, while possessing antimicrobial properties like phenols, have been shown to be toxic to the plant cells as well[14].

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ADVENTITIOUS BUD FORMATION FROM LEAF CULTURES OF CASTOR (*RICINUS COMMUNIS* L.)

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SUCCESS in regeneration and propagation *in vitro* has been achieved in several oil crops. However, very