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SHORT COMMUNICATION

# FUNGITOXIC ACTIVITY OF PROANTHOCYANIDINS

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Effect of certain proanthocyanidins on the growth of the fungus *Rhizoctinia solani* Kuhn, was studied. All the compounds showed good fungitoxic activity.

Proanthocyanidins. (leucoanthocyanins) are one of the growth promoting components in the coconut milk, the liquid endosperm of *Cocos nucifera* and in the fluid extracts of immature fruits of horsechestnut, *Aesculus woerlitzensis* (Shantz and Steward, 1955; Steward and Shantz, 1959), Proanthocyanidins extracted from *Pinus*, cocoa etc. were found to enhance the growth of carrot explants (Steward, 1968). Proanthocyanidins extracted and isolated from diverse plant sources promoted the growth of *Lemna paucicostata* Hegelm. (Rao *et al.*, 1980) and that growth promotion was associated with increased levels of chlorophylls (Rao and Rao, 1985), RNA and protein nitrogen (Rao and Rao, 1984). Proanthocyanidins also stimulated the initiation and growth of roots on stem cutting of *Phaseolus vulgaris* Linn. (Rao *et al.*, 1980a).

Several groups of phenolics are known to be fungitoxic and are associated with the disease resistance in the plants and the literature in this aspect was reviewed by several workers (Walker and Stahmann, 1955; Farkas and Kiraly, 1962; Cruickshank, 1963; Owens, 1963 and Tomiyama, 1963). In view of the prolific occurrence of proanthocyanidins in the plant kingdom and the possibility of their role in disease resistance, the present experiment is conducted to determine the effect of proanthocyanidins on the growth of *Rhizoctinia solani* Kuhn., the causal organism of sheath blight of paddy, in culture.

The extraction and isolation procedures of procyanidins from the unripe fruits of *Pnoenix sylvestris* Roxb., and *Anona squamosa* Linn,, propelargonidins from the stem bark of *Cassla javanice* Linn., and *Peltophorum pterocarpum* (DC) Backer *ex.* Heyne, prorobinetinidin from the stem bark of *Acacia leucoph-*

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*loea* Linn., Proanthocyanidin from the roots of *Dichrostachys cinera* (Linn.) Wright and Arn., were described in our earlier communications (Rao *et al.*, 1980, 1980 a)

The fungitoxic activity of the compounds was evaluated by agar plate technique (Horsfall, 1945), using 8-day old culture of *R. solani* on Haywards media using three sclerotial bodies in each plate. Each compound was tried at four concentration levels viz., 50 ppm, 100 ppm, 200 ppm, and 400 ppm. After four days of growth, the diameter of the colony was measured from which the area of the colony was calculated and the results in terms of percentage inhibition of growth is shown in Table I.

Table I : Effect of proanthocyanidins on the growth of *R. solani.* Results expressed in terms of per cent inhibition of growth (Mean ± S. E. at 5% level of significance).

| Compounds | Concentration | | | |
|---|---|---|---|---|
| | 50 ppm | 100 ppm | 200 ppm | 400 ppm |
| Procyanidin from *P. sylvestris* | 6.7±0.5 | 19.4±1.3 | 31.2.±1.9 | 72.7±4.9 |
| Procyanidin from *A. squamosa* | 21.4±2.7 | 27.3±1.2 | 36.6±2.4 | 66.4±2.9 |
| Propelargonidin from *C. javanica* | 2.2±0.1 | 17.4±1.6 | 36.6±1.0 | 84.2±4.9 |
| Propelargonidin from *P. pterocarpum* | 17.4±0.3 | 25.5±0.9 | 55.0±3.4 | 71.5±2.5 |
| Prorobinetinidin | 15.2±0.5 | 25.9±1.7 | 34 9±4.0 | 84.2±4.0 |
| Proanthocyanidin from *D. cinera* | 13.1±2.2 | 17.4±1.8 | 40.3±3.6 | 75.0±6.5 |

All the proanthocyanidins showed good fungitoxic activity. Among all the compounds tested, propelargonidin from *C. javanica* and prorobinetinidin showed maximum fungitoxic activity at 400 ppm concentration.

The present study reveals that, proanthocyanidins, though growth stimulating at low concentrations (Steward, 1968 and Rao *et al.*, 1980), are fungitoxic at higher concentrations. Thus proanthocyanidins behave similar to many other groups of phenolic compounds as fungitoxic and may be one of the endogenous substances contributing to the disease resistance in the plants.

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