dandotica, *A. daviesi*, *A. exponens*, *A. granulosa*, *A. granulosa* var *chhumbiensis*, *A. laminosa*, *A. leymeriei*, *A. mamillata*, *A. orientalis*, *A. spinosa*, *A. spira*, *A. subspinosa*, *Rotalic trochidiformis* and *Operculina* sp. The above foraminiferal assemblage suggests an Early Eocene to early Middle Eocene age. Tewari and Kumar[10] reported *Nummulites atacicus*, *N. subatacicus*, *Assilina subspinosa*, and *Dictyoconoides vredenburgi* from the beds of the Subathu Group exposed in the Nilkanth valley, Garhwal Himalaya and concluded an Early Eocene age for the Subathu Group. Singh[11] recorded *Fasciolites oblonga*, *Lockhartia hunti*, *L. hunti* var. *pustulosa*, *Nummulites* sp., *N. atacicus*, *N.* aff. *N. atacicus*, *N.* cf. *mamilla*, *N. subatacicus*, *N.* (*Assilina*) *dandotica*, *N.* (*A.*) *granulosa* var. *chhumbiensis*, *N.* (*A.*) *laminosa N.* (*A.*) *spinosa*, *N.* (*A.*) *subspinosa*, *N.* (*A.*) *sublaminosa* and *Orbitolites* sp. from the different formations of the Subathu Group exposed in Jammu Himalaya and suggested an Early Eocene to early Middle Eocene age to the foraminiferal Subathu rocks. Tewari and Gupta[12] reported *Nummulites atacicus*, *N.* cf. *mamilla*, *N. djokdjokartae*, *Assilina* cf. *granulosa*, *A. granulosa* var. *chhumbiensis*, *A. leymeriei*, *A. subdaviesi* from the Early Eocene strata of Surkhet area (Nepal).

The aforementioned facts suggest that the Early Eocene and early Middle Eocene strata exposed in the Lesser Himalaya (Punch-beyond Dhading) and in various parts of Zaskar Mountain are not much different from one another in terms of fauna, age, palaeoenvironment and lithology. Therefore, it may be safely concluded that during Early Eocene time the Tethys sea transgressed the Lesser and Zaskar Himalayas from the Potwar region (Pakistan) in the form of two narrow arms. One arm of this sea occupied a foredeep, formed in the Lesser Himalayan region due to pre-Eocene tectonic movement, stretching from Muzaffarabad through north of Uri, north of Punch, Kalakot, Jangalgali, Dalhousie, Subathu, Dharampur, Dadahu, Nilkanth, Dogadda, south of Nanital in India to Karnali river valley and beyond Dhading in Nepal. The second arm of the sea occupied another foredeep and resulted from the pre-Eocene tectonic movement in the Zaskar area, extending from Uri region to the north of Amarnath cave and Markha valley and beyond Singhe La. The area between the aforementioned foredeeps was a positive-area.

The writer is thankful to Prof. S. N. Singh, Head, Department of Geology, Lucknow University, for fruitful discussion.

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EFFECT OF PEANUT MOTTLE AND RUST ON GROWTH PARAMETERS, NODULATION AND NITROGEN CONTENT OF GROUNDNUT

IN Marathwada, groundnut has been reported to be infected with peanut mottle, tomato spotted wilt viruses and rust.[2–4] Since in some legumes, rust infection enhances the susceptibility to viruses, the combined effect of Peanut mottle virus (PMV) and rust on groundnut was studied.

A pot experiment was conducted in randomized block design using six treatments and five replications (Table I). Peanut mottle and rust maintained on SB-XI groundnut cultivar was used for inoculation. Mechanical inoculation with virus and aerial inoculation using rust uredospores were done by the procedure described earlier[3]. Observations on growth characters were recorded following the procedure described by Singh and Mall[6]. Nitrogen was estimated by the modified Kjeldahl's method. Rust severity was recorded as the number of pustules per leaflet while mottle severity was assessed by the amount of leaflets exhibiting PMV symptoms.

The results presented in Table I indicate that PMV and rust singly or in combination did not have any adverse effect on shoot lengths. However, rust alone reduced significantly the fresh and dry weight of shoot and fresh weight of root. PMV and rust either singly or in combination did not have any adverse effect on nodulation, fresh and dry weight of nodules and the nitrogen content. In the presence of rust, the severity of virus infection was reduced. Similarly the presence of virus adversely affected the rust severity. Highest

TABLE I

Effect of peanut mottle virus and groundnut rust on growth parameter of groundnut

Treatments	Severity of		Shoot length (cm)	Root length (cm)	Weight of shoot (g)		Weight of roots (g)	
	[a]Rust	[b]Virus			Fresh	Dry	Fresh	Dry
1. Rust alone	28	..	18·4	22·9	4·5	1·8	0·4	0·4
2. Virus alone	..	+++	16·2	24·7	5·6	2·1	0·9	0·7
3. Rust first + virus 10 days after rust inoculation	21	++	18·0	20·8	4·6	1·6	0·7	0·4
4. Virus first + rust 10 days after virus inoculation	6	++	16·6	25·2	5·9	2·2	1·0	0·7
5. Virus + rust inoculations simultaneously	12	++	14·9	24·3	7·1	2·2	0·9	0·7
6. Control	..	..	16·0	26·9	6·4	2·7	0·8	0·7
SE ±	..	..	1·4	6·2	0·3	0·2	0·07	0·08
CD at 5%	..	..	N.S.	N.S.	1·0	0·5	0·2	N.S.

a = Rust severity as no. of uredo-pustules per leaflet.
b = Mottle severity as + = 1–10%, ++ = 11–25%, +++ = 25% and above leaflets showing symptoms.

inhibition in rust development was observed when plants were inoculated with virus 10 days prior to rust inoculation. Wide deviation in growth parameters among different treatments can be attributed to the interactions of PMV and rust (Table I) and their partial mutual antagonism in groundnut host[7].

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NEW RECORDS OF FUSARIAL ROTS OF PETHA FRUITS

THE fruit diseases of Petha (*Benincasa hispida* Cogn.) have largely remained unexplored. Recent surveys have revealed that about 20% fruits in godowns and about 7% of those in the fields are spoiled due to mycrobial agents. The diseased fruits from both the godowns and fields were brought to the laboratory to undertake the present investigations.

Adopting the usual mycological techniques, the fungi were isolated separately from the rotten tissues collected from fields and godowns. Each purified isolate was inoculated on surface sterilized healthy fruits by knife injury method[4] and also by spraying a dense spore suspension on surface of the sterilized fruits. Five replicates, each consisting of three fruits, were employed for each isolate. The inoculated and corresponding control fruits were wrapped separately in sterilized polythene bags and incubated at 27° C (± 1° C) for a week. Fruits were then examined for rotting, reisolation of the inoculated fungi, for assessing the extent of rotting and to identify the enzymes[1] involved.