

roots is due to frequent forking and interconnections.

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EFFECTS OF LEAF EXTRACT OF *VITEX NEGUNDO* ON *LATHYRUS SATIVUS* LINN.

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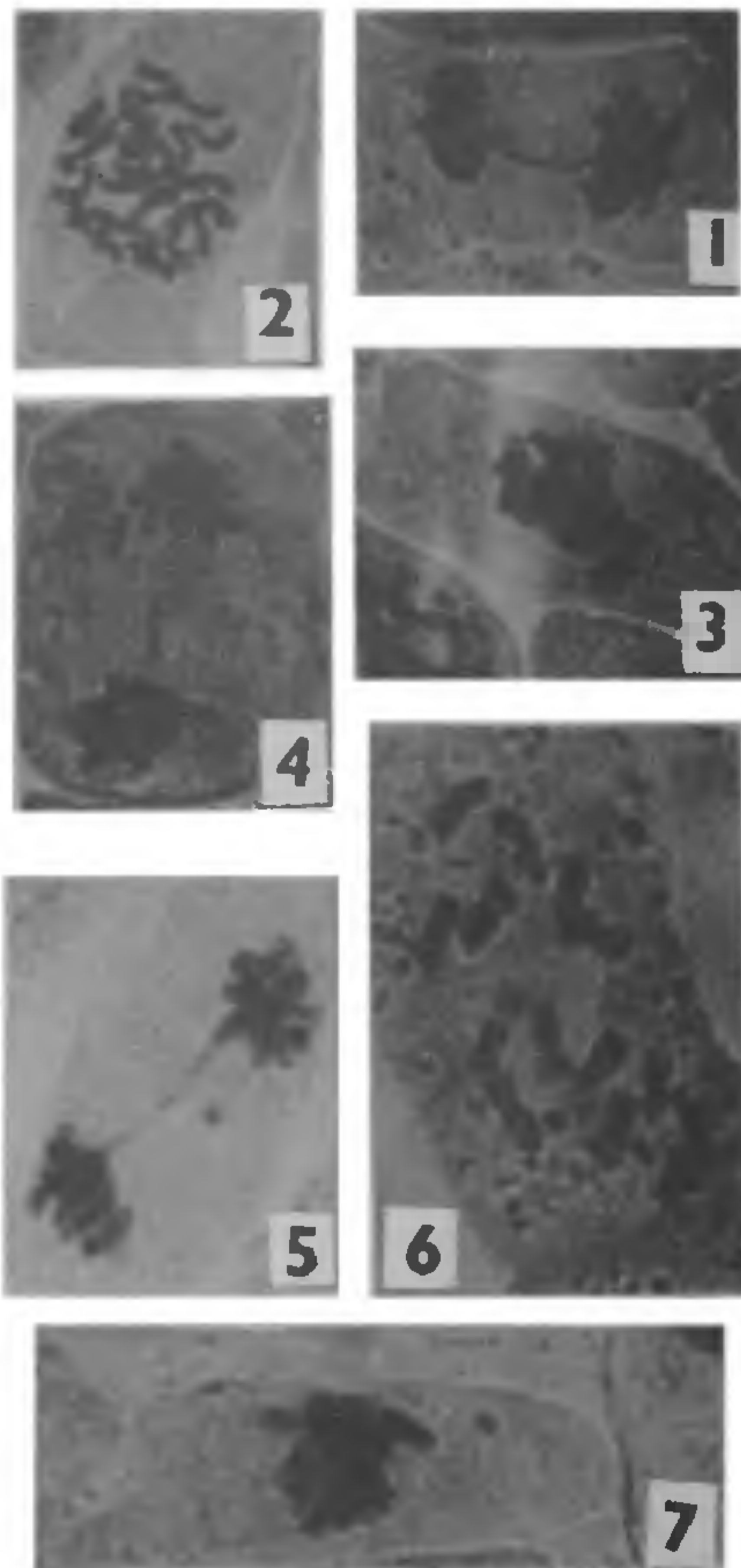
THE leaves of *Vitex negundo* of the family Verbenaceae are generally used by the farmers as a grain-preserving material. As farmers use these leaves of *Vitex negundo* against insect protection of the pulses, it has been considered worthwhile to study the effects of these leaf extracts on the root tips of one of the commonly used pulses, *Lathyrus sativus*. With this end in view, the present investigation has been undertaken.

Extracts have been made with boiled distilled water. One gram of leaf dust of *V. negundo* has been taken and this dust has been mixed with 100 ml boiled distilled water. The mixture, after shaking for 1 hr, has been filtered after cooling and the filtrate has been considered to be 1%. From this stock solution other concentrations have been prepared (0.5%, 0.25% and 0.1%) for the investigation. Germinated seeds of *Lathyrus sativus* have been treated with different concentrations of the leaf extract for varying periods (3, 6, 12, 24 and 48 hr). After the treatment root tips have been fixed in 1 : 3 acetic acid-ethanol mixture for 1 hr and then squashed following usual aceto-orcein procedure.

In the present investigation it has been found that the mitotic index decreases in the case of treated roots in contrast to the control in different concentrations and durations. Within the dividing cells, high percentage of metaphase abnormalities have been observed in 0.25% and 0.5% concentrations and no normal metaphase stage has been noted. Metaphase stages have been found in higher percentages than prophase stages but anaphase and telophase stages occur in a low percentage. The overall abnormalities

are disturbance in polarity, clumping, scattered metaphase, fragments, polyploidy, stickiness, bridges and laggards, etc. Among the abnormalities, clumping, scattering and bridges have been prominently noticed.

The leaf extract of *V. negundo* on root tips of *Lathyrus sativus*, causes imbalance in the frequencies of mitotic stages. A high percentage of the frequency of metaphase has been found. The high percentage of metaphase stage may be at the expense of prophase stage, which has been observed at very low frequency in relation to metaphase stage. This finding agrees



Figures 1-7; 1. Somatic bridge; 2. Polyploidy; 3. Clumping; 4. Laggard chromosome; 5. Somatic bridge with a fragment; 6. Scattered metaphases; 7. fragment.

with previous observations^{1,2}. Low frequency of anaphase, telophase and prophase and high frequency of metaphase indicate the occurrence of metaphase arrest. This metaphase arrest is a C-mitotic effect which may indicate that the leaf extracts studied here possess narcotic effect similar to that of colchicine. Colchicine causes an increase in the mitotic index because of its property of metaphase arrest which tallies with the previous observations^{3,4}.

A reduction in the mitotic index has been observed in the roots treated for long periods in different concentrations of the leaf extract. But the mitotic stages have been low in some cases. Thus the reduction in the mitotic index may be due to the inhibitory effect of the extract at the onset of mitosis in spite of the existence of metaphase arrest. The effect of this leaf extract differs to some extent, from that of colchicine, which is corroborated by the previous data.^{2,5}

Though the effects of leaf extract reveal a similarity with that of colchicine, the decrease in mitotic index may indicate its mitotoxic effect. This toxicity of the leaf extract may serve to protect the grains from insect attacks. The narcotic effect resulting into metaphase arrest may also harm the reproductive potentiality of the insects, thereby influencing the production of insect progenies. Therefore, the mitotoxic effect as well as C-mitotic effect of the leaf extract may act simultaneously in protecting grains from insect attacks.

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NEW ADDITIONAL HOSTS OF *PENTALONIA NIGRONERVOSA* COQ.

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THE banana aphid, *Pentalonia nigronervosa* Coq., was first reported¹ as a vector of the "bunchy top" disease of banana. Wardlaw² reported that the banana aphid is host-specific, that it is not known to live and flourish on hosts other than *Musa* species. The report also states that the aphid colonizes only on banana

plants. Banana aphid colonies were occasionally observed¹ on plants of *Ravenala* and *Strelitiza* spp. growing in the proximity of banana stools in the Royal Botanic Garden, Brisbane. Urich³ observed these aphids on wild banana, on balisier (*Heliconia bihai*) and on other monocotyledonous plants in Trinidad. Wolcott⁴ recorded the presence of *P. nigronervosa* on Tannia in Puerto Rico and Ocfemia and Buhay⁵ observed them on imported *Calla* flowers and on *Hedychium coronarium* Kolling (Zingiberaceae) in the Phillipines. Uppal *et al.*⁶ and Varma and Capoor⁷ observed that this aphid colonizes in nature on *Chhoti elaychi* (*Elettaria cardamomum*) and Vasudeva⁸ reported it on large cardamom (*Amomum subulatum*). Siddappaji and Reddy⁹ observed *P. nigronervosa* var. *caladii* v.d. Groot occurring on *Colocasia* plants. But so far, there is no record on *P. nigronervosa* colonizing on *Colocasia* and other allied species.

During the survey of some banana plantations in the Vasai (Bassein) Taluka of Thane District in Maharashtra State, it was observed that *Colocasia* with purple stalk was often grown by banana growers as a mixed crop in banana fields. It was interesting to note that some aphids, appearing like *Pentalonia*, were present at or near the leaf bases of these plants. The present study was carried out to ascertain whether *P. nigronervosa* could colonize on *Colocasia* and other allied species of the family Araceae.

Pentalonia aphids were collected from banana plants growing at the College of Agriculture, Pune and were identified as *Pentalonia nigronervosa* Coq. These aphids were released on healthy seedlings of *Colocasia antiquorum* Schott. having purple/black or green stalks and also on stalk of *Alocasia* sp. The plants were enclosed in muslin cages. It was found that the aphids preferred colonizing on these hosts; the multiplication rate was faster and higher on these plants during the period January to March 1981 when the maximum temperature was in the range of 24 to 30° C. From April 1981 onwards, however, there was a reduction in the aphid population on the plants. It appeared that the aphid preferred leaf base and also stalks of these plants. Both winged and apterous forms were noticed on the same stalk.

The colonization of *P. nigronervosa* Coq. on *Colocasia* and *Alocasia* spp. reported here constitutes the first record from India.

Further studies on the biology and on the behavioural and epidemiological aspects of this aphid species on these hosts and on allied plant species are under way. Studies are also in progress to ascertain whether these additional hosts of *P. nigronervosa* serve as reservoirs of the banana 'bunchy top' disease in nature and if so, whether these plant species play a role in the spread of this disease in banana plantations.