in vivo germination is only of the order of 1 % the level of inhibition recorded on treated stigmas is significant. The results are summarised in table 1.

The exudates were analysed to determine the chemical nature of the inhibitory components. Two-way chromatography revealed that the stigmatic exudates of the sterile species were characterised by two spots not present in the chromatograms of the fertile species. Responses of these unique spots to various location reagents indicated that they were flavonoids. When eluates of these spots were substituted for the exudates, they induced suppression of pollen germination nearly equal to that of the exudates themselves both *in vivo* and *in vitro*. Spectrophotometric profiles of the eluates revealed bands I and II and other characteristics associated with flavonoids.

These findings focus attention on two points. The total inhibition discussed here is different from the selective suppression of self pollen germination associated with incompatibility. Also, as against the prevailing view of the involvement of stigmatic proteins in inhibition responses, present studies indicate that at least in the sterile species examined, flavonoids are apparently responsible for pollen germination inhibition. An earlier report[4] mentioned the stimulatory and inhibitory properties of the flavonoids in pollen wall deposits but the study did not attempt an analysis of stigmatic exudate. Stigmatic flavonoids have been identified[5], but this is the first time their role in germination control receives attention.

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NEW RUSTS ON THE *GENUS POPULUS*

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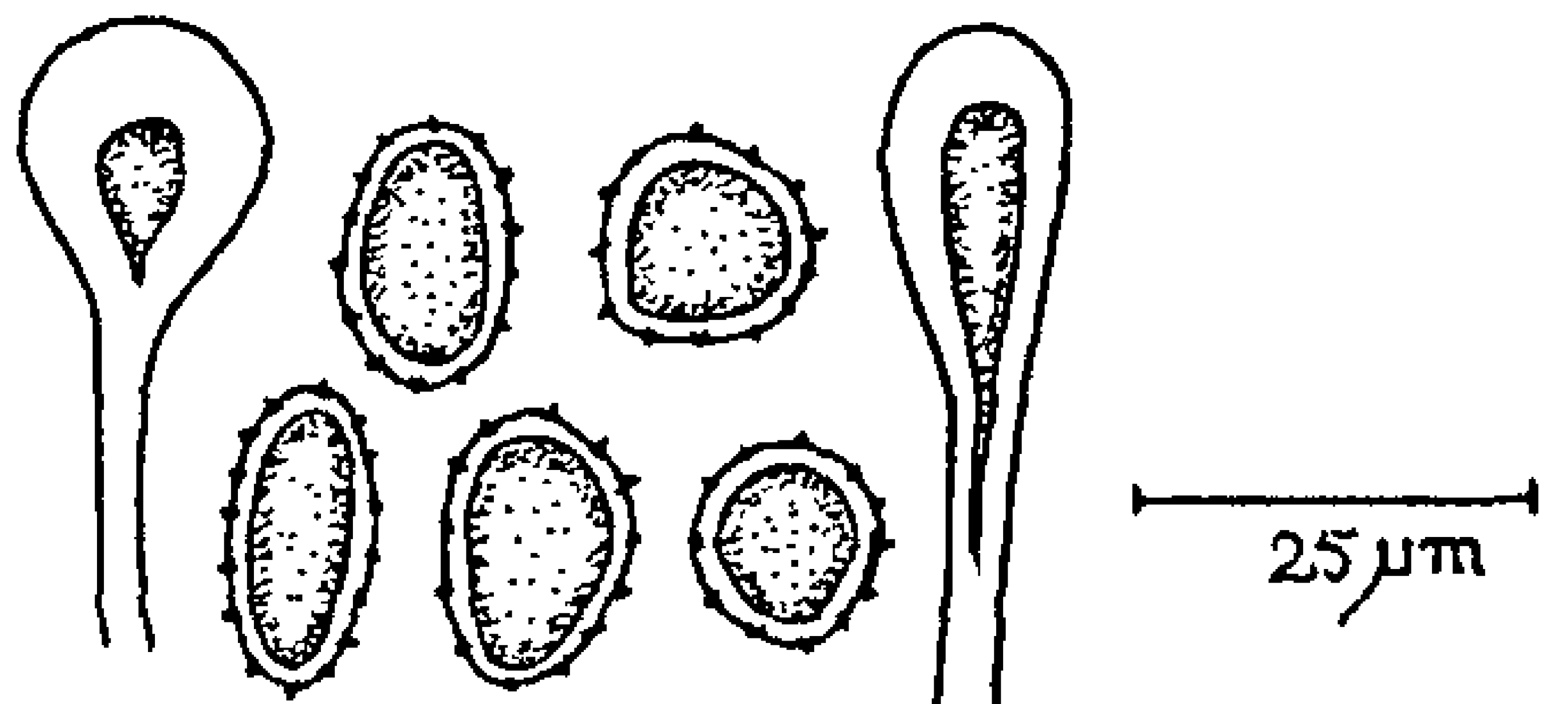
CASTAGNE[1] erected the genus *Melampsora* in 1843. Most of the species reported so far parasitize the host genera *Populus* and *Salix* of the family Salicaceae. However, a few are known to infect members of other families *viz.*, Apocynaceae, Asclepiadaceae, Bignoniaceae, Euphorbiaceae, Guttiferae, Linaceae, Saxifragaceae and Scrophulariaceae.

Recently the authors had the opportunity of critically examining more than a thousand specimens of *Melampsora* obtained from 25 International Herbaria. From their study, particularly those on *Populus* they have come across two new rusts; their account is presented in this paper.

Uredo theumenii Bagyanarayana and Ramachar sp. nov. (figure 1) Pycnia et aecia ignota.

Urediniis minutis, hypophyllis, sparsus, subepidermalibus, erumpentis, pulverulentis, 0.3 mm, pallide



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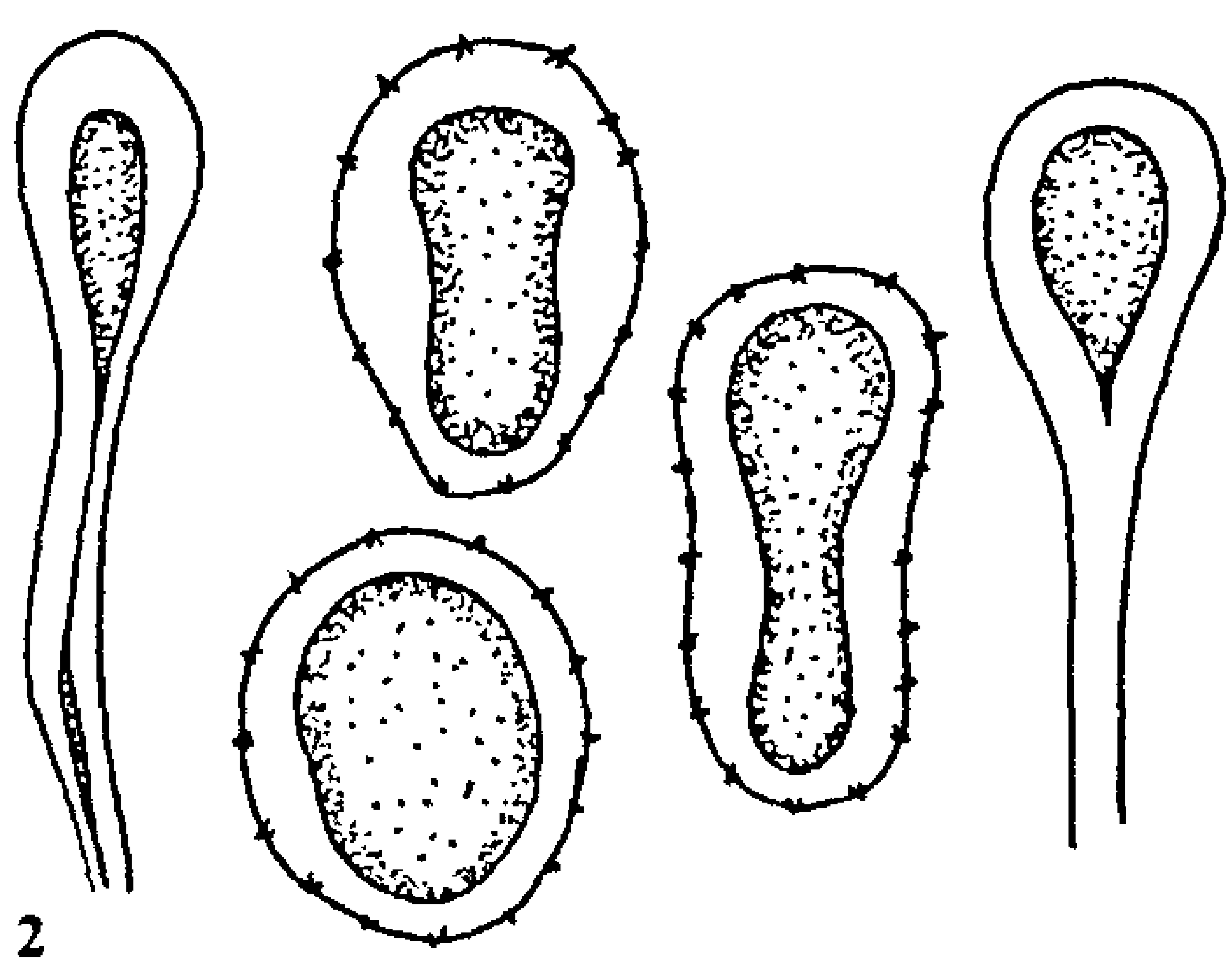

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Figures 1 & 2. Camera lucida drawings of **1.** *Uredo theumenii* Urediniospores with paraphyses and **2.** *Uredo zillerii* Urediniospores with paraphyses.

flavus; urediniosporis 13–17 × 9.5–16 μm, globosis, subglobosis, vel late ellipsoidis, membrana 1.5–2 μm in crassa, echinulata; paraphyses clavatis ad capitatis, usque ad 25 μm longo, 8–11 μm late, 1.5–2.5 μm in crassa.

Holotypus: In foliis *Populus tremula* L., Austria, September 1871 (de Thumen, Fungi Austriaci 38) PAV.
Pycnia and aecia are not known.
Uredinia minute, hypophyllous, scanty, subepidermal, erumpent, pulverulent, 0.3 mm, pale yellow; urediniospores 13–17 × 9.5–16 μm, globose, subglobose, or broadly ellipsoide, wall 1.5–2 μm thick, echinulate; paraphyses clavate to capitate, upto 25 μm in length, 8–11 μm wide, 1.5–2.5 μm thick.

Holotype: On *Populus tremula* L., Austria, September 1871 (de Thumen, Fungi Austriaci 38) PAV.

The urediniospores of this rust resemble somewhat those of *Melampsora microspora* Tranz. et Eremeeva[2] in shape and size but differ in having thinner urediniospore walls.

Uredo zillerii Bagyanarayana and Ramachar sp. nov. (figure 2) Pycnia et aecia ignota.
Urediniis hypophyllis, sparsus, subepidermalibus, 1 mm, aurantiaco flavescentibus; urediniosporis 32–65 × 17.5–35 μm, ovato ad late ellipsoidis, membrana 2–3.5 μm in crassa, incrassatus lateralis 2.5–8.5 μm, prominenter echinulata; paraphysis clavatis, usque 70 μm longo, 10–15 μm late.

Holotypus: In foliis *Populus trichocarpa* T. & G., Royal Oak, V.I. British Columbia, Canada, W.G. Ziller, DAVFP.
Pycnia and aecia not known.
Urdenia hypophyllous, scattered, subepidermal, usually having an intact epidermal covering, upto 1 mm, orange yellow; urediniospores 32–65 × 17.5–35 μm, ovate to broadly ellipsoid, wall 2–3.5 μm thick, laterally thickened upto 2.5–8.5 μm, prominently echinulate; paraphyses clavate, upto 70 μm long, 10–15 μm wide.

Holotype: On *Populus trichocarpa* T. & G., Royal Oak, V.I. British Columbia, Canada, W.G. Ziller, DAVFP.

Uredo zillerii is based on material which Dr W. G. Ziller, Canadian Forestry Service, has kindly gifted to us. He identified this as *M. occidentalis* Jacks[3]. We could not find the presence of telia and teliospores in the specimen. However, the urediniospores that are present differed from those described for *M. occidentalis*. Accordingly, the rust has been assigned to the form genus *Uredo*.

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CHLORFLURENOL-INDUCED LEAF ABERRATION IN *CICER ARIETINUM* L.

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CHLORFLURENOLS (morphactin) are a novel group of synthetic bio-regulants which exhibit a wide range of influence on plant growth, development and morphogenesis[1]. The effect of some of them has been reported on leaves and flowers of different taxa[1]. Chlorflurenol methyl ester 74050 increases the number of flower buds in soyabean, a few other legumes and tomato[2]. It also brings out leaf modifications in *Cicer arietinum*[3]. A complete reduction in the lamina of leaf, being represented by stipules only, has also been observed in *Cicer arietinum*.

The plants of *C. arietinum* (Chickpea) cv. BG203 were sprayed with 10 and 100 ppm of chlorflurenol after 35 days of sowing for three consecutive days using 0.02 % tween-80, a surfactant.

The leaves of normal plants are stipulate, alternate, compound, imparipinnate and leaflets are opposite or alternate, ovate, elliptical with acute tip, obtuse leaf-base and serrate margin (figure 1). After 15 or 20 days of morphactin treatment, the lateral branches and leaves arising from them show a number of modifications. Usually the 4th internode is reduced considerably while the 5th one is elongated greatly. The leaves are not normal. In some leaves, the rachis is ill-developed and all the leaflets develop at its tip (figures 11–17). The leaflets fuse among themselves and in