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*.

We acknowledge with gratitude the help of Dr. D. B. O. Savile of Biosystematics Research Institute, Canada, the cooperation of Dr W. G. Ziller, Canadian Forestry Service, Forest Research Laboratory, Canada (DAVFP) and Dr. Vanda Terzo, the Curator, Instituto Di Botanico Orto Botanico, Pavia, Italy (PAV) for loaning certain specimens in connection with this study. GB is thankful to the authorities of UGC and CSIR for financial assistance.

28 June 1983; Revised 29 September 1983

1. Castagne, L., *Obs. Plant Acotyl. Fam. Ured.* 1943, **2**, 18.
2. Tranzschel, W., et Eremeeva, Tranzschel Consp. Ured. URSS, Moscow, 1939, p. 155.
3. Jackson, H. S., *Phytopathology*, 1917, **7**, 354.

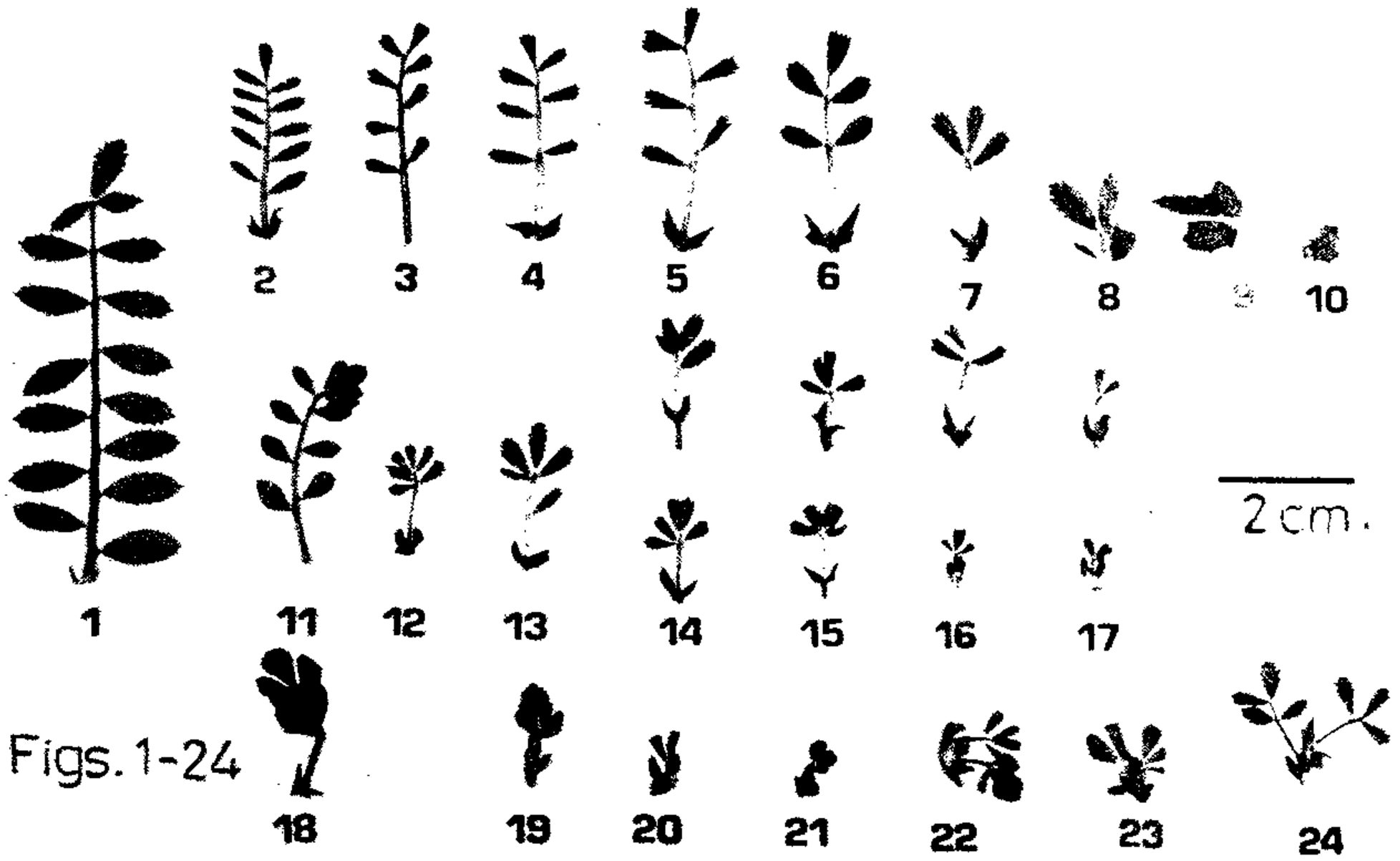
CHLORFLURENOL-INDUCED LEAF ABERRATION IN *CICER ARIETINUM* L.

PAWAN K. JAIWAL and S. BHAMBIE
Department of Botany, Kurukshetra University, Kurukshetra 132 119, India.

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



Figures 1–24. 1. Leaf (control) **2–9.** Reduction in number of leaflets. **10.** Node with stipules only. **11–17.** Leaflets condensation at top of rachis and reduction in number of leaflets. **18–19.** Fusion of all the leaflets of a leaf. **22–24.** Leaves of 3rd and 4th nodes fused with stipules.

some cases a simple bladed leaf has been noted (figures 18–19). In other leaves, there has been a gradual reduction in the size of the rachis as well as in the number of leaflets (figures 2–9). Stipules of 3rd and 4th node also fuse with leaves (figures 21–24). The leaf on the 5th node at times bears only stipules as the lamina of the leaf is reduced completely (figure 10). The frequency of such stipule bearing more or less naked nodes has been found to be more with 100 ppm *i.e.* in 53.4% laterals each has 2.1 such nodes whereas with 10 ppm 41.6% laterals each has 1.38 such nodes. Leafless nodes in *Riccinus communis* have already been described when the plants were treated with a different morphactin[4] (EMD 7301 W).

The authors are thankful to Dr L. C. Lamba, for facilities and to CSIR for financial assistance to PKJ..

1 August 1983; revised 13 september 1983

1. Schneider, G., *Annu. Rev. Plant Physiol.*, 1970, **21**, 499.
2. Merck, E., *Technical Information*, 1971. Morphactins.
3. Jaiwal, P. K. and Bhambie, S. *Acta Indica Botanica.*, 1982, **10** (in press)
4. Varkey, M. and Nigam, R. K., *Ann. Bot.*, 1981, **47**, 699.

EFFECTS OF INDOLE ACETIC ACID AND GIBBERELLIC ACID ON THE AKINETE FORMATION OF *PITHOPHORA OEDOGONIA* (MONT.) WITTROCK.

S. C. AGRAWAL

Department of Botany, Banaras Hindu University, Varanasi 221005, India.

ALTHOUGH considerable information exists concerning the effects of IAA and GA_3 on the growth stimulation of a number of algae[1–3], there is little or no information on the possible role of IAA and GA_3 in the sporulation of green algae. The present investigation deals with the effects of IAA and GA_3 on the akinete formation of *Pithophora oedogonia.*

This alga was collected from a freshwater pond at the University campus. Clonal cultures were raised