nucleus was somewhat centrally placed (Fig. 1 c). Numerous spherical residual masses were detected in these smear preparations.

FIG. 1. (*a*) Large-sized merozoites, (*b*) Small-sized merozoites, thin and slender form, (*c*) Small-sized merozoites, robust and stumpy form.

The size range in the larger-sized merozoites, in our material, accommodates the dimension given by Sarwar (10·0 μ × 1·5 μ). The size mentioned by Soliman (1960), however, agrees in length but differs in a greater width (10·0 μ × 1·8 μ) of the merozoites. The two smaller merozoites are within the size range indicated by Levine (4·5–7·5 μ × 1·2–2·0 μ) who has, however, not mentioned whether the dimensions relate to merozoites in smears or sections. It is likely that the robust form, in our material, in the smaller-sized merozoites might really represent an earlier stage in development of the thin and slender of the smaller merozoites. Further work is in progress to determine their correct status. Our smear preparations have yielded more than one type of merozoites in the abomasal schizonts belonging to *Eimeria*. Specific determination has finally to await a complete elucidation of the endogenous stages in all the eimerian parasites of goat currently known from their oocysts.

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IN VITRO CULTURE OF EXCISED EMBRYONAL AXES OF *CLITORIA TERNAETA* LINN.

THE cultivation of isolated embryonal organs in sterile culture adds to our knowledge of morphogenesis in the embryo. This method of experimental study is also useful in assessing the relationships between embryonal organs. Isolated embryo segments like hypocotyl, epicotyl and cotyledonary node have already been grown successfully in culture (*see* Kusum Kanta and Padmanabhan, 1964).

In the present study excised embryonal axes of *Clitoria ternatea* were grown on nutrient agar. Nitsch's (1951) basal medium supplemented with vitamins was found to be ideal for normal growth of embryonal organs. Embryos were dissected out aseptically from green pods which were previously surface-sterilized by immersion in chlorine water for 15 minutes. After severing the cotyledons, the axis was planted in nutrient agar. The tubes were placed in a culture room maintained at 24° C. ± 1° C. and with 12 hours of illumination per day.

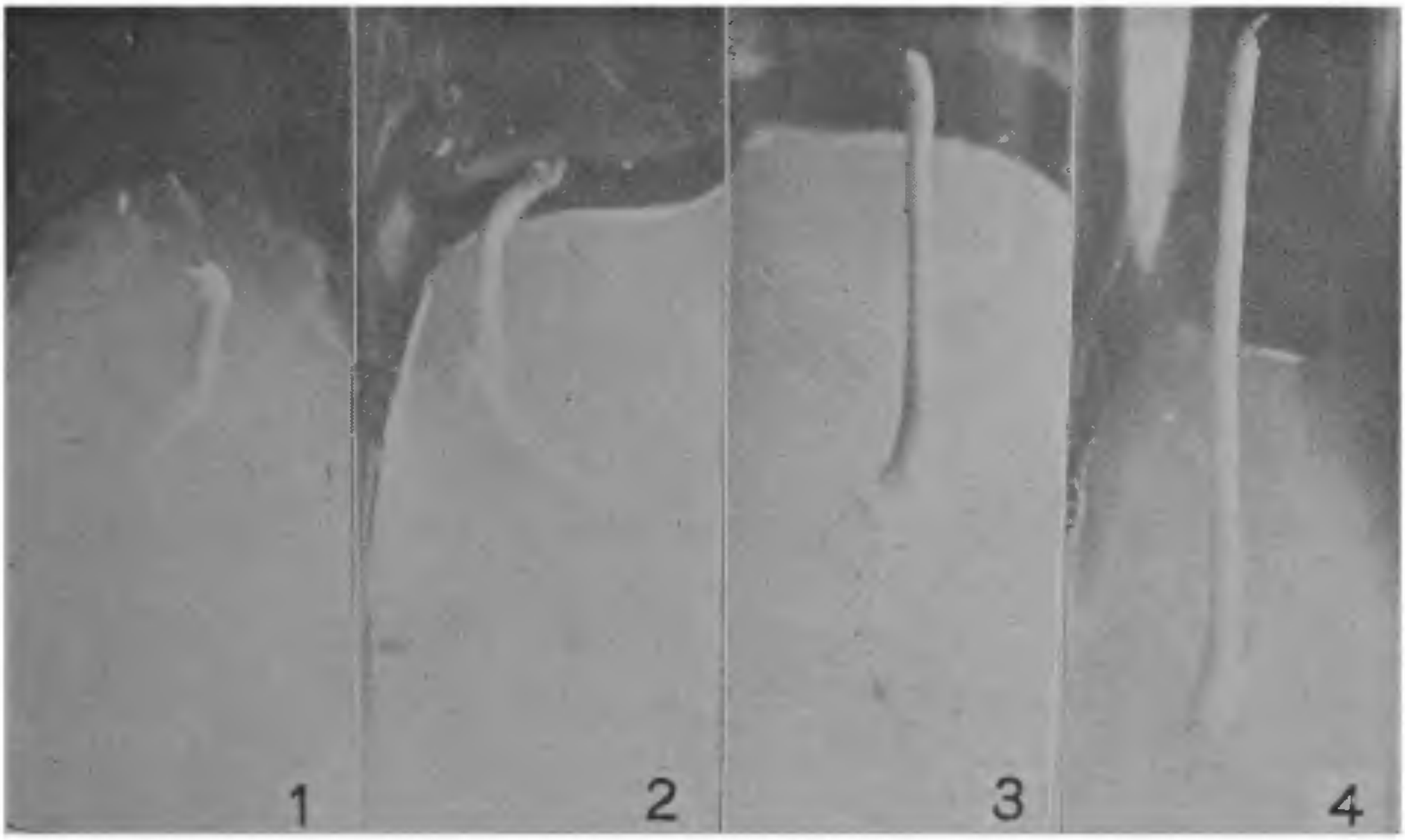
A majority of the cultured embryonal axes increased in size during the second day after inoculation. On the third day the root apical meristem was active and the tap root was evident on the following day. Elongation of the hypocotyl was noticed on the fourth day (Fig. 1). By this time the axis turned green.

Within a period of 15 days several secondary roots developed and ramified in the agar (Fig. 3). The terminal bud remained inactive upto 20 days.

In a second set of experiments the hypocotyl was isolated by a transverse cut below the cotyledonary node and planted on nutrient agar. In this case the course of development of the hypocotyl was similar to the one described for entire axes. Elongation was not affected by removal of apical bud (Fig. 3).

Normal plants were obtained from all the cultures of entire axes.

A curious feature observed during the growth of the hypocotyl was the curvature of its upper



FIGS. 1-4. *In vitro* culture of embryonal axis of *Clitoria ternatea*. Fig. 1. Axis after four days' growth. The root and the hypocotyl have elongated. Fig. 2. 6-day-old axis. Note the bending of the hypocotyl. Fig. 3. 15-day culture of hypocotyl devoid of apical bud. Note initiation of adventive roots at the base. Fig. 4. 25-day-old culture of the axis. Note the developing epicotyl bud.

portion recalling the condition during natural germination. Even though there is no need for the cultured axes to 'pull out the cotyledons' the occurrence of curvature in the upper hypocotyl may be viewed as a gene-controlled phenomenon.

The course of growth of the axis is remarkably similar to the events of natural germination : 1. growth of root ; 2. elongation of hypocotyl ; 3. activation of shoot bud.

The results of this experimental study are comparable with the work on *Cajanus cajan* embryo segments (Kusum Kanta and Padmanabhan, 1964). It is evident from these experiments that embryonal organs are capable of independent development when isolated. However, the pattern and course of their development follow the same lines as in the entire embryo.

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POLLEN MORPHOLOGY OF A NEW SPECIES OF *CUSCUTA*

POLLEN morphology of a new species of *Cuscuta*, namely, C. *santapaui* Banerji and Das[1] (*in* press) has been studied. Polliniferous material has been collected from Nepal and the pollen grains have been mounted in lactic acid.[3-6] Terminology used for pollen description is after those of Nair.[4] Pollen grains are 5-7-zonocolpate, spheroidal (equatorial diameter 30·4 μ ; range 28–32 μ). Apocolpium diameter is 13·6 μ. Exine is 3·2 μ thick ; ectine thicker than endine, surface rugulate.

We have examined the specimen sheets of Wallich and Hooker, that have been referred by Yuncker[7] to *C. reflexa* Roxb. Pollen grains from both the above materials have been found to measure 27·2 μ (range 24–29 μ) and the exine surface to be rugulate. Nair and Rehman[5] give the pollen diameter in *C. reflexa* as 28 μ, and exine surface in the above and other Indian species, namely, *C. chinensis* and *C. planiflora* as reticulate. The exine in this new species—*C. santapaui*—is comparatively thicker.

It is noted that interspecific pollen differences exist within the genus *Cuscuta*. Erdtman[2] recorded the colpi number as 3-4 in *C. [illegible] num* and 3 in *lupiliformis*, while Nair and