

ORGANOGENESIS AND REGENERATION FROM COTYLEDON CULTURES OF NIGER *GUIZOTIA ABYSSINICA* (L.f.) Cass.)

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Organogenesis and regeneration of Niger (*Guizotia abyssinica*) from adventitious buds induced on cotyledon explants is described. Excised cotyledons were inoculated on MS medium supplemented with various combinations of BAP, KN, NAA, IAA, IBA and 2,4-D. After 30 days the entire explant was covered with clump of shoot buds and shoots. The clump was cut into small bits and reinoculated on MS medium containing low concentrations of hormones, develops into whole plants.

Keywords : *Guizotia abyssinica*; *in vitro*; Organogenesis.

Guizotia abyssinica (Asteraceae), commonly known as niger is native of Abyssinia and grown widely in India and East Africa (Anonymous, 1956). Niger is grown for its seeds, which yield a yellow, edible semidrying oil, used in cooking, oil lamps, soaps and paints. The pressed cake is used as livestock feed and as manure (Mc Gregor, 1976). The oil is also used for pharmaceutical purposes (Chavan, 1961).

In the literature there is no report on *in vitro* work of niger. We, therefore undertook *in vitro* work and the present investigation deals with organogenesis and regeneration from cotyledon cultures of niger. The

seeds of niger were soaked in distilled water overnight and surface sterilised with 0.1% $HgCl_2$ solution for 3 min. followed by repeated washings with sterilised distilled water. The sterilised seeds were aseptically inoculated on MS basal medium for germination. The cotyledons excised from one week old seedlings were inoculated on MS (1962) medium fortified with BAP (Benzyl aminopurine), KN (Kinetin), IAA (Indole-3-acetic acid), 2,4-D (2,4-Dichloro phenoxy acetic acid), IBA (Indole butyric acid), NAA (Naphthalene acetic acid) and Folic acid in various concentrations and combinations. The cultures were maintained at $25 \pm 2^\circ C$ with 16 hrs. illumi-

Table 1. Response of Niger Cotyledons on Various Growth Regulators

Hormonal combination (mg/l)	No. of explants showing response	% response	Nature of response
MS + BAP 4 + Folic acid 2	16	80	Callus
MS + BAP 3 + IAA 4	14	70	"
MS + KN 6 + 2,4-D 3	17	85	"
MS + KN 4 + IBA 3	11	55	"
MS + KN 3 + NAA 3	13	65	Callus + roots
MS + BAP 4 + IBA 3	15	75	Multiple shoots
MS + BAP 3 + NAA 5	12	60	Callus + multiple shoots
MS + BAP 4 + KN 4	17	85	Callus + multiple shoots

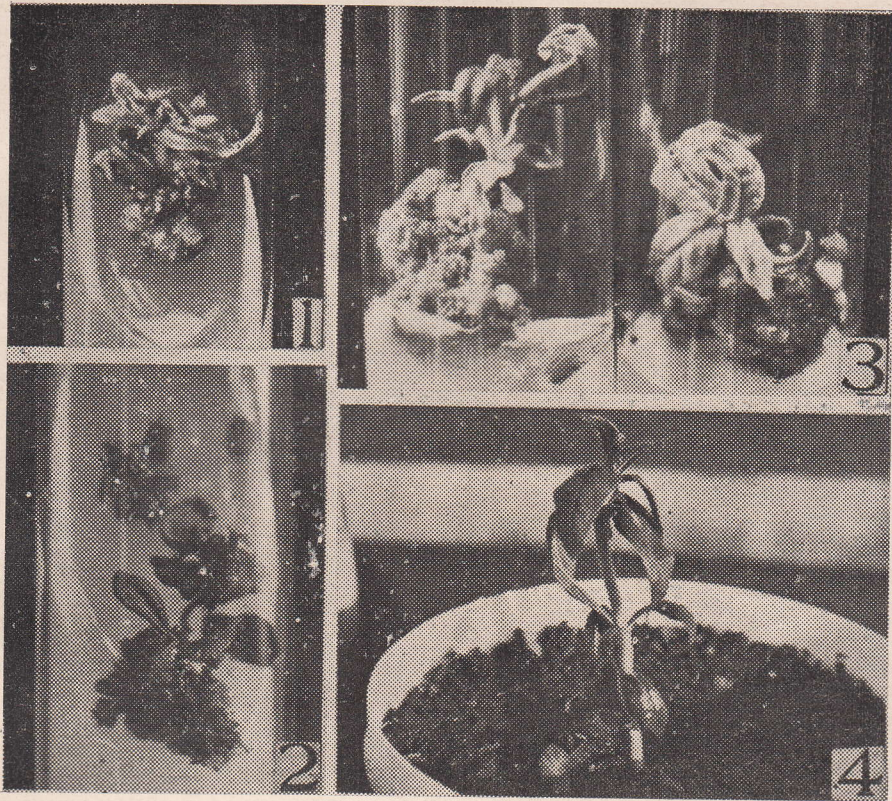
20 cotyledons were cultured in each treatment.

nation at 2000 lux. For each treatment 20 cultures were raised and all the experiments were repeated twice.

The response of niger cotyledons on MS medium fortified with various growth regulators is shown Table 1. Callus induction was observed from the cotyledon within 3 days of incubation on MS medium supplemented with various growth regulators (Table 1) but exuberant callusing was observed on MS + KN 6 mg/l + 2,4-D 3 mg/l. The callus is light green coloured and nodular type. Callus mediated rhizogenesis was observed from cotyledon on MS + KN 3 mg/l + NAA 3 mg/l. The roots are red in colour, provided with root hairs and 2-4 cms long. Callus mediated multiple shoot bud induction was observed within 30 days of incubation on MS + BAP 4 mg/l + KN 4

mg/l (Fig. 1). Direct multiple shoot bud induction was observed within 10 days of incubation on MS + BAP 4 mg/l + IBA 3 mg/l (Fig. 2). Entire explant was covered with clump of shoot buds and shoots. Clump was cut into small bits and inoculated into the same MS medium containing lower concentration of hormones, proliferated and developed into whole plants (Fig. 3). These plants attained a size of 3-5 cms upon transferring into pots (Fig. 4).

The results described suggest the potential of niger cotyledons to produce multiple plantlets by manipulation of IBA, NAA and KN in combination with BAP in the medium. Direct regeneration from cotyledon helps in clonal multiplication and in conserving genetic stability of niger and related species.



Figs. 1-4.1—Multiple shoot bud induction from callus on MS + BAP 4 mg/l + KN 4 mg/l. 2—Clusters of shoot buds originating directly from cut ends of cotyledon on MS + BAP 4 mg/l + IBA 3 mg/l. 3—Callus mediated plantlet formation on MS + BAP 3 mg/l + KN 1 mg/l. 4—A potted plant (45 days old).

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